RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Solid Waste Management Unit 54
RCRA Facility Investigation/
Corrective Measures Study Report

Volume II

FINAL
SEPTEMBER 2008

PREPARED BY:

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APPENDIX C

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APPENDIX C.1

PHYSICAL SOIL SAMPLE RESULTS

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Radford Army Ammunition Plant SWMU 54

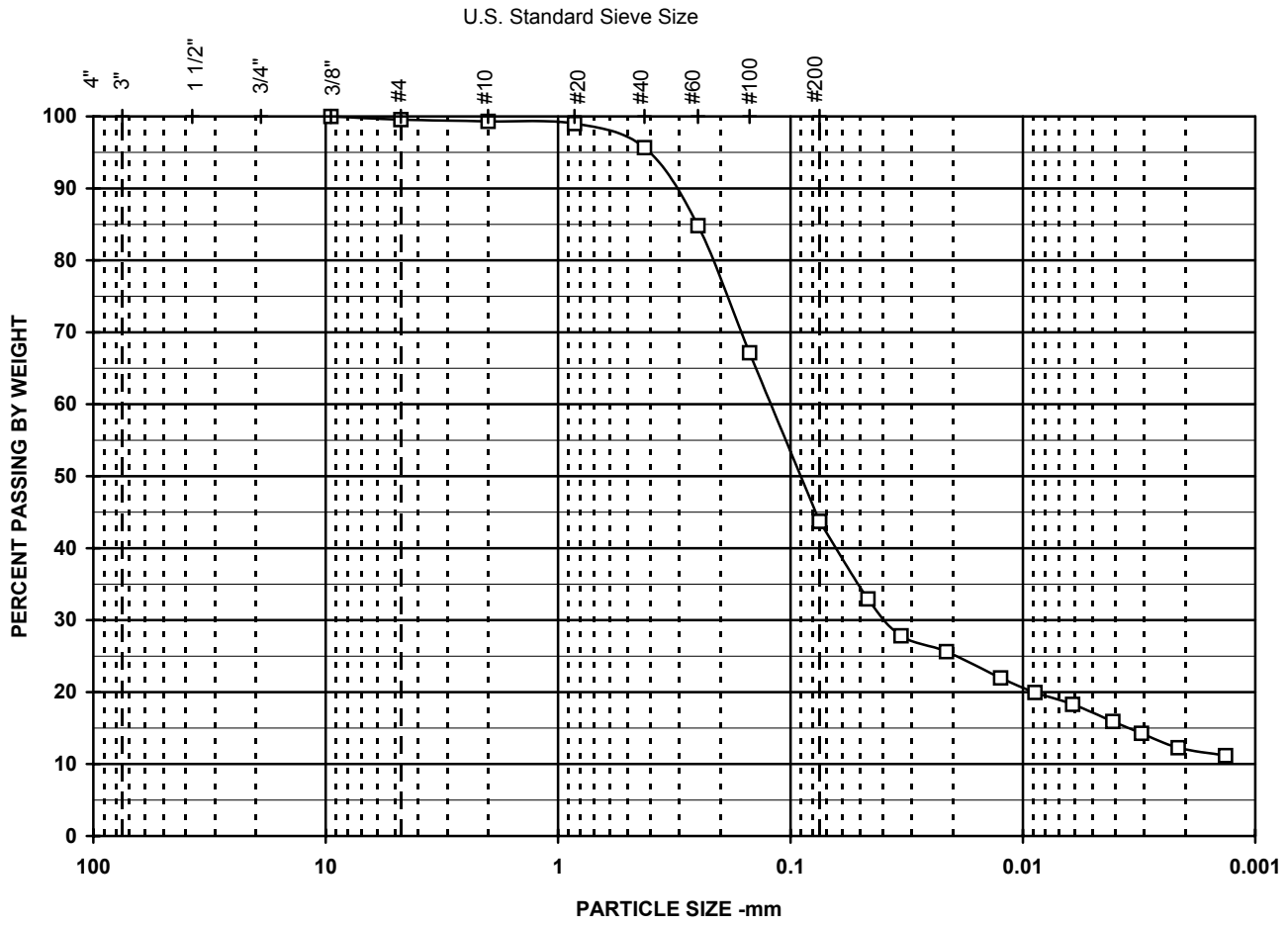
LABORATORY TESTING DATA SUMMARY

BORING	D2216	D4318				D422		D4972		D2974	D854	D2937		D5084	CALCULATED POROSITY			REMARKS
	WATER	LIQUID	PLASTIC	PLAS.	USCS	SIEVE	HYDRO.	pH		ORGANIC	SOIL	TOTAL	DRY	HYDRAULIC	TOTAL	AIR-FILLED	WATER-FILLED	
NO.	CONTENT	LIMIT	LIMIT	IND.	SYMB.	MINUS NO. 200	% MINUS 2 μm	Distilled Water	0.01 M CaCl Solution	CONTENT (burnoff)	PARTICLE DENSITY	BULK DENSITY	BULK DENSITY	CONDUCTIVITY	SOIL POROSITY	SOIL POROSITY	SOIL POROSITY	
	(%)					(%)	(%)			(%)	(-)	(pcf)	(pcf)	(cm/sec)	(-)	(-)	(-)	
54 A-SM	21.2	21	19	2	SM	43.7	12	7.3	7.0	1.7	2.706	119.2*	98.3*	3.5E-7	0.42*	0.06*	0.36*	P6642
54 B-CL	25.8	26	17	9	SC	41.9	22	6.2	5.9	3.5	2.708	124.0	98.6	1.7E-6	0.42	0.01	0.41	P6641
54 B-GM	11.5	np	np	np	SP-SM	9.4	3	8.1	7.1	1.5	2.713	119.9*	107.6*	3.6E-3	0.36*	0.12*	0.24*	P6644
54 B-ML	18.8	26	18	8	SC	49.9	15	5.6	5.0	1.5	2.722	125.3	105.5	3.7E-6	0.38	0.04	0.34	P6640
54 B-SM	23.7	26	23	3	SM	40.9	12	7.5	7.4	3.4	2.712	115.9*	93.7*	3.0E-5	0.45*	0.06*	0.39*	P6643
54 B-SP 1	17.6	np	np	np	SM	26.0	6	7.8	*(1)	1.4	2.746	106.5*	90.5*	8.6E-4	0.47*	0.14*	0.33*	P6646
54 B-SP 2	13.3	np	np	np	SM	19.3	5	*(1)	*(1)	1.5	2.735	106.3*	93.8*	1.4E-3	0.45*	0.18*	0.27*	P6645

Note: (1) Not enough sample to perform testing.

* Density and porosity after laboratory specimen compaction.

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



SYMBOL	DESCRIPTION AND REMARKS
□	dark brown silty f. SAND, trace m. sand.
■	
○	

Symbol	□	■	○
Boring	54 A- SM		
Sample			
Spec			
Depth			
% +3"			
% Gravel	0.4		
% SAND	55.9		
% FINES	43.7		
% -2μ	12		
Cc			
Cu			
LL	21		
PL	19		
PI	2		
USCS	SM		
w (%)			

Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"			
3/4"			
3/8"	100.0		
4	99.6		
10	99.3		
20	99.0		
40	95.7		
60	84.8		
100	67.2		
200	43.7		

PARTICLE SIZE DISTRIBUTION

Radford Army Ammunition Plant SWMU 54

Project No.		
31737767	May 2003	Figure

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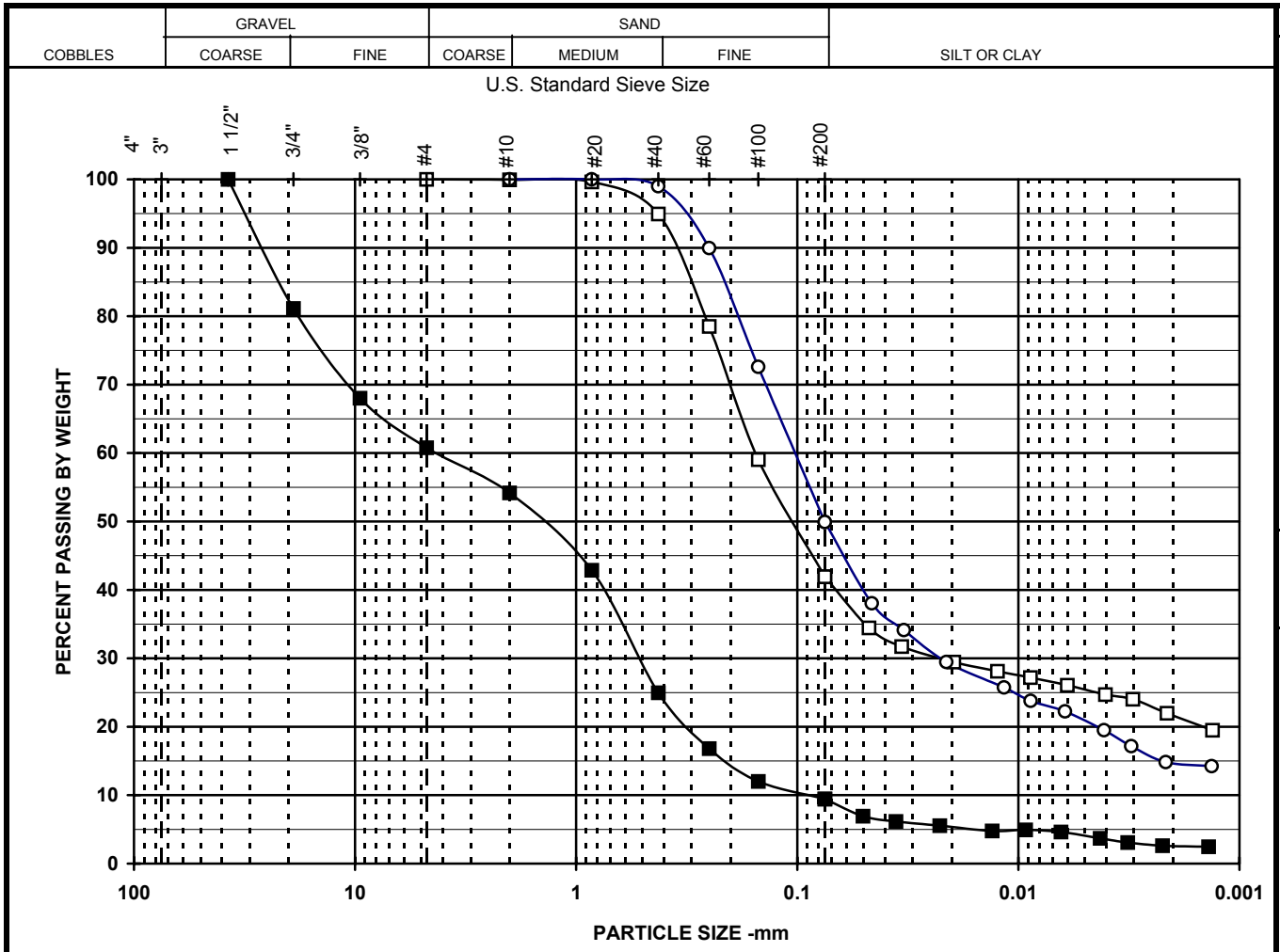


SYMBOL	DESCRIPTION AND REMARKS
□	brown clayey f. sand, trace m. sand.
■	brown gravelly c-f SAND, trace silt.
○	brown silty clayey f. SAND, trace m. sand.

Symbol	□	■	○
Boring	54 B- CL	54 B-GM	54B-ML
Sample			
Spec			
Depth			
% +3"			
% Gravel		39.2	
% SAND	58.1	51.4	50.1
% FINES	41.9	9.4	49.9
% -2μ	22	3	15
Cc		0.7	
Cu		48.5	
LL	26	np	26
PL	17	np	18
PI	9		8
USCS	SC	SP-SM	SC
w (%)			

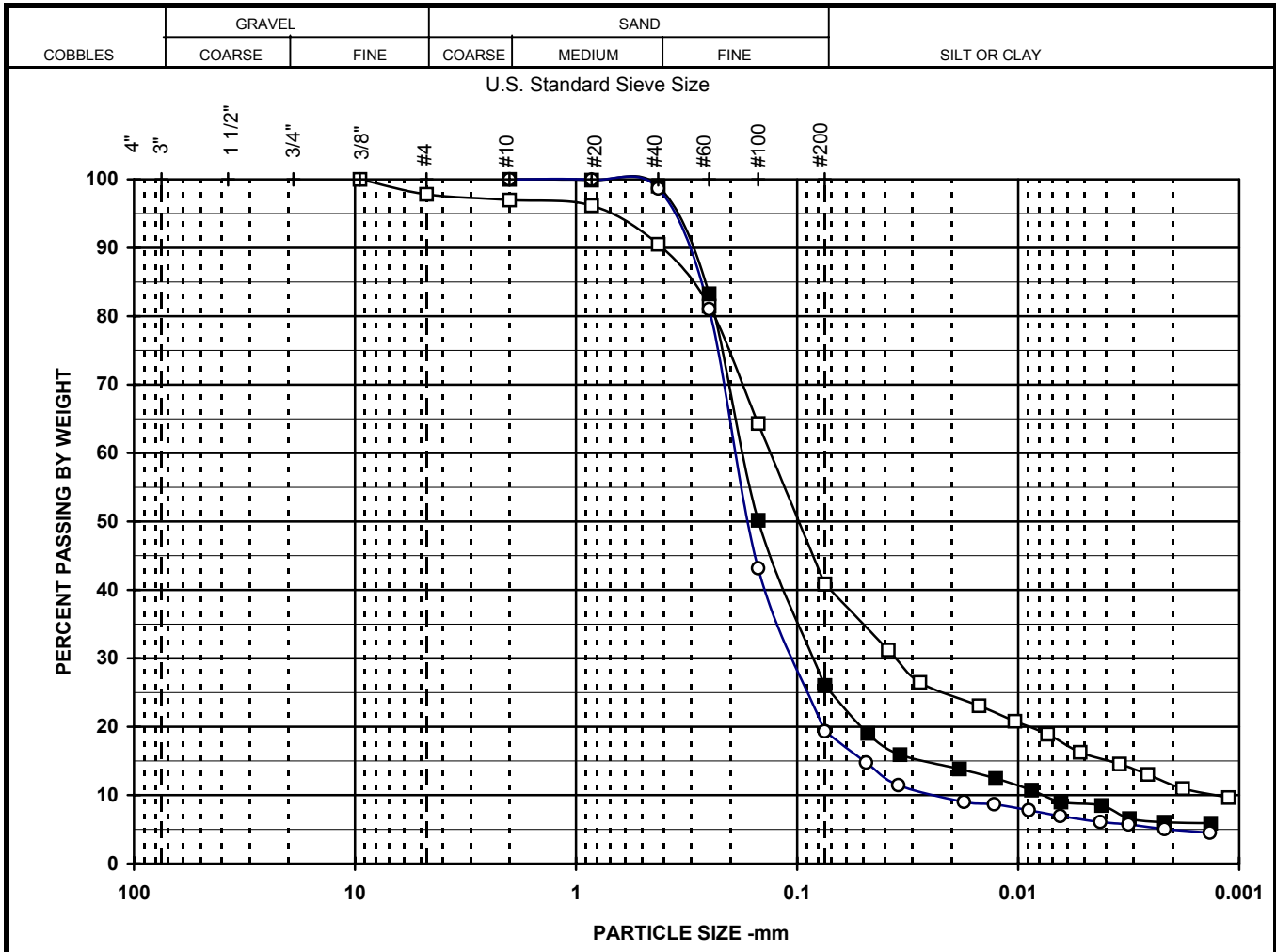
Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"		100.0	
3/4"		81.1	
3/8"		68.0	
4	100.0	60.8	
10	99.9	54.2	
20	99.6	42.9	100.0
40	94.9	25.0	99.0
60	78.5	16.8	90.0
100	59.0	12.0	72.6
200	41.9	9.4	49.9

PARTICLE SIZE DISTRIBUTION

Radford Army Ammunition Plant SWMU 54

Project No.		Figure
31737767	May 2003	

URS Corporation



SYMBOL	DESCRIPTION AND REMARKS
□	dark brown silty c-f SAND, trace f. gravel.
■	brown f. SAND, some silt.
○	brown f. SAND, some silt.

Symbol	□	■	○
Boring	54 B- SM	54 B-SP 1	54 B-SP 2
Sample			
Spec			
Depth			
% +3"			
% Gravel	2.2		
% SAND	56.9	74.0	80.7
% FINES	40.9	26.0	19.3
% -2μ	12	6	5
Cc			
Cu			
LL	26	np	np
PL	23	np	np
PI	3		
USCS	SM	SM	SM
w (%)			

Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"			
3/4"			
3/8"	100.0		
4	97.8		
10	97.0	100.0	100.0
20	96.2	99.9	99.9
40	90.5	99.0	98.7
60	81.5	83.3	81.0
100	64.3	50.2	43.2
200	40.9	26.0	19.3

PARTICLE SIZE DISTRIBUTION

Radford Army Ammunition Plant SWMU 54

Project No.		Figure
31737767	May 2003	

URS Corporation

Radford Army Ammunition Plant SWMU 54

SUMMARY OF LABORATORY PERMEABILITY TESTS PERFORMED ON THIN-WALLED TUBE SAMPLES

BORING NO.	LIMITS		WATER CONTENTS	TOTAL UNIT WGTS	DRY UNIT WGTS	STRESSES	DURING CONSOL.	DURING TEST	COEFFICIENT OF PERM. K, @ 20° C	REMARKS
	LIQUID	PLAS. INDEX	INITIAL	INITIAL	INITIAL	EFFECTIVE	TIME	PERMEANT		
	PLASTIC	USCS SYMBOL	PRE-TEST (%)	PRE-TEST (pcf)	PRE-TEST (pcf)	BACK PRESSURE (psi)	VOLUMETRIC STRAIN (days, %)	INITIAL GRADIENT	(cm/sec)	
54 A-SM	21	2	21.2	119.2	98.3	5.0	over night	tap water		Reconstituted
	19	SM	22.3	128.9	105.4	100.0	6.7	18	3.5E-7	P6642
54 B-CL	26	9	25.8	124.0	98.6	5.0	over night	tap water		
	17	SC	27.3	123.8	97.3	100.0	-1.4	19	1.7E-6	P6641
54 B-GM	NP	NP	11.5	119.9	107.6	5.0	over night	tap water		Reconstituted
	NP	SP-SM	17.9	134.4	114.0	100.0	5.6	1	3.6E-3	P6644
54 B-ML	26	8	18.8	125.3	105.5	5.0	over night	tap water		
	18	SC	22.5	129.1	105.4	100.0	-0.1	21	3.7E-6	P6640
54 B-SM	26	3	23.7	115.9	93.7	5.0	over night	tap water		Reconstituted
	23	SM	29.6	121.7	93.9	100.0	0.2	13	3.0E-5	P6643
54 B-SP 1	NP	NP	17.6	106.5	90.5	5.0	over night	tap water		Reconstituted
	NP	SM	31.2	121.1	92.3	100.0	1.9	2.2	8.6E-4	P6646
54 B-SP 2	NP	NP	13.3	106.3	93.8	5.0	over night	tap water		Reconstituted
	NP	SM	28.4	123.4	96.1	100.0	2.4	1.8	1.4E-3	P6645

Note: Samples marked as reconstituted did not have sufficient form to test as received and were compacted in the laboratory with a "moderate" effort.

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 31737769 BORING: 54 A-SM Test No.: P6642

Project Name: RFAAP-SWMU 54 SAMPLE: DEPTH (ft):

Specimen - Apparatus set-up - Test Information Cell No. 6 Apparatus No. 4 Stage No.: 2

Preliminary Length/Area Calculations

Lo =	3.992	in	Lo=	10.139	cm
dLc=	0.010	in	Ao =	20.18	cm^2
Lc=	3.982	in	Vo =	204.58	cm^3
			Lc=	10.114	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	1.54	cm^3
			Vc =	203.04	cm^3
Sc =	0.504	cm^{-1}	Ac=	20.076	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or		
	x	with stones or		Stones with filter paper or		top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination		
3) During saturation: Water flushed up sides of specimen to remove ai	x	No		Yes		
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation		
6) Permeant: water used	x	Tap		Distilled		
or		Demineralized		0.005 N calcium sulfate (CaSO4)		Permeability

Equations Used

Kt = - 0.0000750 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 ºC = RT * Kt TubeC= 1.3181

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	10.114	cm	ε_{axial} =	0.3%	
Ac =	18.874	cm^2			
Vc=	190.89	cm^3	ε_{vol} =	6.7%	
Sc =	0.536	cm^{-1}	Sc = Lc / Ac , final		

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	21.18	119.2	98.3	79.8
PreTest	22.28	128.9	105.4	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 ºC: **3.52E-07** cm/sec

(i_o)ave = 17.8

Tested By: DT Reviewed By: G. Thomas

Consol Stage-Trial No.	Temp. ° C	Date	Time hr	min	sec	Initial σ_c psi	Ub psi	U-tube Reading Head (cm) (cc)	Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20ºC cm/sec Dev. from Ave.
initial	20.5	5/13/03	13	30	00	105.0	100.0	59.90	45.45	0.99	3.20E-07
final	20.5	5/13/03	13	48	00			58.35	45.95		3.38E-07
1	RT = 0.992	dT =	18.00 min			σ'_c =	0.7 ksf	0.116	0.117	io= 18.0	-4%
initial	20.5	5/13/03	13	49	00	105.0	100.0	59.90	45.45	1.03	3.36E-07
final	20.5	5/13/03	14	11	00			57.95	46.05		3.55E-07
2	RT = 0.992	dT =	22.00 min			σ'_c =	0.7 ksf	0.145	0.141	io= 18.0	1%
initial	20.5	5/13/03	14	12	00	105.0	100.0	59.90	45.45	1.00	3.29E-07
final	20.5	5/13/03	14	26	00			58.64	45.85		3.48E-07
3	RT = 0.992	dT =	14.00 min			σ'_c =	0.7 ksf	0.094	0.094	io= 18.0	-1%
initial	20.5	5/13/03	14	28	00	105.0	100.0	59.90	45.95	1.01	3.48E-07
final	20.5	5/13/03	14	48	00			58.12	46.51		3.67E-07
4	RT = 0.992	dT =	20.00 min			σ'_c =	0.7 ksf	0.133	0.131	io= 17.3	4%
initial											
final											
initial											
final											

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 31737767 BORING: 54 B-CL Test No.: P6641

Project Name: RFAAP-SWMU 54 SAMPLE: DEPTH (ft):

Specimen - Apparatus set-up - Test Information Cell No. 4 Apparatus No. 3 Stage No.: 2

Preliminary Length/Area Calculations

Lo =	3.225	in	Lo=	8.190	cm
dLc=	0.016	in	Ao =	12.18	cm^2
Lc=	3.209	in	Vo =	99.77	cm^3
			Lc=	8.150	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	1.49	cm^3
			Vc =	98.29	cm^3
Sc =	0.676	cm^{-1}	Ac=	12.060	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or		
	x	with stones or		Stones with filter paper or		top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination		
3) During saturation: Water flushed up sides of specimen to remove ai	x	No		Yes		
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation		
6) Permeant: water used	x	Tap		Distilled		
or		Demineralized		0.005 N calcium sulfate (CaSO4)		

Equations Used

Kt = - 0.0000756 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 ºC = RT * Kt TubeC= 1.316

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	8.150	cm	ε_{axial} =	0.5%	
Ac =	12.412	cm^2			
Vc=	101.16	cm^3	ε_{vol} =	-1.4%	
Sc =	0.657	cm^{-1}	Sc = Lc / Ac , final		

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	25.75	124.0	98.6	97.6
PreTest	27.25	123.8	97.3	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 ºC: **1.68E-06** cm/sec

(i_o)ave = 18.7

Tested By: DT Reviewed By: G. Thomas

Consol Stage-Trial No.	Temp. ° C	Date	Time hr	min	sec	Initial σ_c psi	Ub psi	U-tube Reading Head (cm) (cc)	Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20ºC cm/sec Dev. from Ave.
initial	20.4	5/13/03	11	18	00	105.0	100.0	60.90	48.75	1.00	1.81E-06
final	20.4	5/13/03	11	27	00			58.38	49.55		1.75E-06
1	RT = 0.995	dT =		9.00 min		σ'_c =	0.7 ksf	0.189	0.190	io= 18.7	4%
initial	20.4	5/13/03	11	28	00	105.0	100.0	60.90	48.75	0.99	1.73E-06
final	20.4	5/13/03	11	39	00			58.03	49.67		1.67E-06
2	RT = 0.995	dT =		11.00 min		σ'_c =	0.7 ksf	0.215	0.218	io= 18.7	0%
initial	20.4	5/13/03	11	40	00	105.0	100.0	60.90	48.75	1.00	1.69E-06
final	20.4	5/13/03	11	50	00			58.30	49.57		1.63E-06
3	RT = 0.995	dT =		10.00 min		σ'_c =	0.7 ksf	0.195	0.195	io= 18.7	-3%
initial	20.4	5/13/03	11	51	00	105.0	100.0	60.90	48.75	1.01	1.71E-06
final	20.4	5/13/03	12	00	00			58.50	49.50		1.65E-06
4	RT = 0.995	dT =		9.00 min		σ'_c =	0.7 ksf	0.180	0.178	io= 18.7	-1%
initial											
final											
initial											
final											

CONSTANT HEAD HYDRAULIC CONDUCTIVITY TEST
ASTM D 5084 - 90

Project No. **31737767** BORING: 54 B-GM

Project Name: SAMPLE: DEPTH (ft): Test No.: **P6644**

Specimen - Apparatus set-up - Test Information Apparatus No. C-2 Cell No. 3 Stage 2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or		
		with stones or		Stones with filter paper or		top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination		
3) During saturation: Water flushed up sides of specimen to remove air:			x	No		Yes
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation		
6) Permeant: water used	x	Tap		Distilled		
		Demineralized		0.005 N calcium sulfate (CaSO4)		

Consol Stage- Trial No.	Temp. ° C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	Dial Indicator in	Pressure Head Reading Mercury (inch)	Pressure Head Reading Gage (psi)	Flow Reading (cm)	Flow Vol (cm3) Rate (cm3/sec)	Fluid Head Reading Head (cm)	Fluid Head Reading Tail (cm)	Total Head Uncorrected Correction Corrected (cm)	Gradient	Permeability Preliminary Final at 20ºC cm/sec
initial	20.5	5/13/03	00	00	00	105.0	100.0	0.407			4.20	97.196	67.90	41.35	26.55		
final	20.5	5/13/03	00	21	31						8.90	0.0753	67.90	41.35	16.20		3.69E-03
1	RT = 0.987	dT =		21.52 min		σ'_c =	0.7 ksf						67.9	41.35	10.35	1.02	3.84E-03
initial	20.5	5/13/03	00	00	00	105.0	100.0	0.407			3.30	93.06	67.90	41.35	26.55		
final	20.5	5/13/03	00	21	32						7.80	0.0720	67.90	41.35	15.49		3.31E-03
2	RT = 0.987	dT =		21.53 min		σ'_c =	0.7 ksf						67.9	41.35	11.06	1.09	3.44E-03
initial	20.5	5/13/03	00	00	00	105.0	100.0	0.407			4.20	78.584	67.90	41.35	26.55		
final	20.5	5/13/03	00	17	49						8.00	0.0735	67.90	41.35	15.81		3.48E-03
3	RT = 0.987	dT =		17.82 min		σ'_c =	0.7 ksf						67.9	41.35	10.74	1.06	3.61E-03
initial	20.5	5/13/03	00	00	00	105.0	100.0	0.407			3.50	86.856	67.90	41.35	26.55		
final	20.5	5/13/03	00	20	00						7.70	0.0724	67.90	41.35	15.57		3.35E-03
4	RT = 0.987	dT =		20.00 min		σ'_c =	0.7 ksf						67.9	41.35	10.98	1.08	3.48E-03

Preliminary Length/Area Calculations

Lo =	3.994	in	Lo=	10.145	cm
Ao=	3.103	in^2	Ao =	20.02	cm^2
Vo=	12.393	in^3	Vo =	203.09	cm^3
Lc =	10.127	cm	Vc =	202.02	cm^3
Ac=	19.949	cm^2	m=	215.11	

Tested By: DT Reviewed By: G. Thomas

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	10.127	cm	ε_{axial} =	0.2%	
Ac =	18.928	cm^2			
Vc=	191.69	cm^3	ε_{vol} =	5.6%	

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	11.48	119.9	107.6	54.3
PreTest	17.91	134.4	114.0	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 ºC: **3.59E-03** cm/sec

(i_o)ave = 1.08

HYDRAULIC CONDUCTIVITY TEST

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 31737767 BORING: 54 B ML Test No.: P6640

Project Name: RFAAP-SWMU 54 SAMPLE: DEPTH (ft):

Specimen - Apparatus set-up - Test Information Cell No. 5 Apparatus No. 2 Stage No.: 2

Preliminary Length/Area Calculations

Lo =	2.823	in	Lo=	7.169	cm
dLc=	0.020	in	Ao =	12.22	cm^2
Lc=	2.803	in	Vo =	87.59	cm^3
			Lc=	7.119	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	1.86	cm^3
			Vc =	85.73	cm^3
Sc =	0.591	cm^{-1}	Ac=	12.043	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or		
	x	with stones or		Stones with filter paper or		top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination		
3) During saturation: Water flushed up sides of specimen to remove ai	x	No		Yes		
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation		
6) Permeant: water used	x	Tap		Distilled		
or		Demineralized		0.005 N calcium sulfate (CaSO4)		Permeability

Equations Used

Kt = - 0.0000752 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 ºC = RT * Kt TubeC= 1.322

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	7.119	cm	ε_{axial} =	0.7%	
Ac =	12.313	cm^2			
Vc=	87.65	cm^3	ε_{vol} =	-0.1%	
Sc =	0.578	cm^{-1}	Sc = Lc / Ac , final		

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	18.82	125.3	105.5	83.8
PreTest	22.50	129.1	105.4	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 ºC: **3.72E-06** cm/sec

(i_o)ave = 20.8

Tested By: DT Reviewed By: G. Thomas

Consol Stage-Trial No.	Temp. ° C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20ºC cm/sec Dev. from Ave.
initial	20.4	5/13/03	11	19	00	105.0	100.0	58.00	46.22	0.98	3.83E-06
final	20.4	5/13/03	11	25	00			54.40	47.40		3.73E-06
1	RT = 0.995	dT =		6.00 min		σ'_c =	0.7 ksf	0.270	0.275	io= 20.8	0%
initial	20.4	5/13/03	11	27	00	105.0	100.0	58.00	46.22	0.99	3.82E-06
final	20.4	5/13/03	11	34	00			53.97	47.53		3.72E-06
2	RT = 0.995	dT =		7.00 min		σ'_c =	0.7 ksf	0.302	0.305	io= 20.8	0%
initial	20.4	5/13/03	11	35	00	105.0	100.0	58.00	46.22	1.01	3.84E-06
final	20.4	5/13/03	11	41	30			54.17	47.44		3.74E-06
3	RT = 0.995	dT =		6.50 min		σ'_c =	0.7 ksf	0.287	0.284	io= 20.8	1%
initial	20.4	5/13/03	11	42	00	105.0	100.0	58.00	46.22	0.98	3.78E-06
final	20.4	5/13/03	11	50	00			53.60	47.67		3.68E-06
4	RT = 0.995	dT =		8.00 min		σ'_c =	0.7 ksf	0.330	0.338	io= 20.8	-1%
initial											
final											
initial											
final											

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 31737767 BORING: 54 B-SM Test No.: P6643

Project Name: RFAAP-SWMU 54 SAMPLE: DEPTH (ft):

Specimen - Apparatus set-up - Test Information Cell No. 1 Apparatus No. 2 Stage No.: 2

Preliminary Length/Area Calculations

Lo =	4.000	in	Lo=	10.159	cm
dLc=	0.015	in	Ao =	19.86	cm^2
Lc=	3.985	in	Vo =	201.81	cm^3
			Lc=	10.121	cm
dVc = 3 Vo * (dLc/Lo)			dVc=	2.27	cm^3
			Vc =	199.54	cm^3
Sc =	0.513	cm^{-1}	Ac=	19.715	cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or			
	x	with stones or		Stones with filter paper or			top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination			
3) During saturation: Water flushed up sides of specimen to remove ai			x	No		Yes	
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only	
5) Direction of permeant :	x	Up during or		Down during permeation			
6) Permeant: water used	x	Tap		Distilled			
or		Demineralized		0.005 N calcium sulfate (CaSO4)			

Equations Used

Kt = - 0.0000752 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 ºC = RT * Kt TubeC= 1.322

TEST SUMMARY

Final Specimen and Test Conditions

Lc = 10.121 cm ε_{axial} = 0.4%

Ac = 19.899 cm^2

Vc= 201.39 cm^3 ε_{vol} = 0.2%

Sc = 0.509 cm^{-1} Sc = Lc / Ac , final

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	23.74	115.9	93.7	79.8
PreTest	29.62	121.7	93.9	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 ºC: **2.96E-05** cm/sec

(i_o)ave = 13.0

Tested By: DT Reviewed By: G. Thomas

Consol Stage-Trial No.	Temp. ° C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20ºC cm/sec Dev. from Ave.
initial	20.6	5/14/03	00	00	00	105.0	100.0	57.00	46.55	1.00	2.99E-05
final	20.6	5/14/03	00	00	37			54.00	47.52		2.93E-05
1	RT = 0.990	dT =		0.62 min		σ'_c =	0.7 ksf	0.225	0.226	io= 13.0	-1%
initial	20.6	5/14/03	00	00	00	105.0	100.0	57.00	46.55	0.99	3.03E-05
final	20.6	5/14/03	00	00	54			53.00	47.85		2.97E-05
2	RT = 0.990	dT =		0.90 min		σ'_c =	0.7 ksf	0.300	0.303	io= 13.0	0%
initial	20.6	5/14/03	00	00	00	105.0	100.0	57.00	46.55	0.99	3.03E-05
final	20.6	5/14/03	00	00	54			53.00	47.85		2.97E-05
3	RT = 0.990	dT =		0.90 min		σ'_c =	0.7 ksf	0.300	0.303	io= 13.0	0%
initial	20.6	5/14/03	00	00	00	105.0	100.0	57.00	46.55	0.99	3.03E-05
final	20.6	5/14/03	00	00	54			53.00	47.85		2.97E-05
4	RT = 0.990	dT =		0.90 min		σ'_c =	0.7 ksf	0.300	0.303	io= 13.0	0%
initial											
final											
initial											
final											

CONSTANT HEAD HYDRAULIC CONDUCTIVITY TEST
ASTM D 5084 - 90

Project No. **31737767** BORING: 54 B-SP 1

Project Name: **RFAAP-SWMU 54** SAMPLE: DEPTH (ft): Test No.: **P6646**

Specimen - Apparatus set-up - Test Information Apparatus No. C-2 Cell No. 5 Stage 2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or		
		with stones or		Stones with filter paper or		top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination		
3) During saturation: Water flushed up sides of specimen to remove air:			x	No		Yes
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation		
6) Permeant: water used	x	Tap		Distilled		
		Demineralized		0.005 N calcium sulfate (CaSO4)		

Consol Stage- Trial No.	Temp. ° C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	Dial Indicator in	Pressure Head Reading Mercury (inch)	Pressure Head Reading Gage (psi)	Flow Reading (cm)	Flow Vol (cm3) Rate (cm3/sec)	Fluid Head Reading Head (cm)	Fluid Head Reading Tail (cm)	Total Head Uncorrected / Correction / Corrected (cm)	Gradient	Permeability Preliminary / Final at 20°C cm/sec
initial	20.7	5/14/03	00	00	00	105.0	100.0	0.218			3.75	48.598	68.00	37.20	30.80		
final	20.7	5/14/03	00	20	30						6.10	0.0395	68.00	37.20	8.50		9.10E-04
1	RT = 0.982	dT =		20.50 min		σ'_c =	0.7 ksf						68	37.2	22.30	2.21	8.99E-04
initial	20.7	5/14/03	00	00	00	105.0	100.0	0.218			4.50	45.496	68.00	37.20	30.80		
final	20.7	5/14/03	00	19	17						6.70	0.0393	68.00	37.20	8.46		9.04E-04
2	RT = 0.982	dT =		19.28 min		σ'_c =	0.7 ksf						68	37.2	22.34	2.21	8.93E-04
initial	20.7	5/14/03	00	00	00	105.0	100.0	0.218			3.30	70.312	68.00	37.20	30.80		
final	20.7	5/14/03	00	31	30						6.70	0.0372	68.00	37.20	8.00		8.38E-04
3	RT = 0.982	dT =		31.50 min		σ'_c =	0.7 ksf						68	37.2	22.80	2.26	8.28E-04
initial	20.7	5/14/03	00	00	00	105.0	100.0	0.218			4.30	57.904	68.00	37.20	30.80		
final	20.7	5/14/03	00	26	00						7.10	0.0371	68.00	37.20	7.98		8.36E-04
4	RT = 0.982	dT =		26.00 min		σ'_c =	0.7 ksf						68	37.2	22.82	2.26	8.25E-04

Preliminary Length/Area Calculations

Lo =	3.995	in	Lo=	10.147	cm
Ao=	3.076	in^2	Ao =	19.85	cm^2
Vo=	12.291	in^3	Vo =	201.41	cm^3
Lc =	10.102	cm	Vc =	198.68	cm^3
Ac=	19.669	cm^2	*m=*	*215.11*	

Tested By: DT Reviewed By: G. Thomas

TEST SUMMARY

Final Specimen and Test Conditions

Lc = 10.102 cm ε_{axial} = 0.5%

Ac = 19.556 cm^2

Vc= 197.55 cm^3 ε_{vol} = 1.9%

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	17.64	106.5	90.5	54.2
PreTest	31.22	121.1	92.3	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **8.61E-04** cm/sec

(i_o)ave = 2.23

HYDRAULIC CONDUCTIVITY TEST

CONSTANT HEAD HYDRAULIC CONDUCTIVITY TEST
ASTM D 5084 - 90

Project No. **31737767** BORING: 54 B-SP 2

Project Name: **RFAAP-SWMU 54** SAMPLE: DEPTH (ft): Test No.: **P6645**

Specimen - Apparatus set-up - Test Information Apparatus No. C-2 Cell No. 4 Stage 2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or		
		with stones or		Stones with filter paper or		top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination		
3) During saturation: Water flushed up sides of specimen to remove air:			x	No		Yes
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation		
6) Permeant: water used	x	Tap		Distilled		
		Demineralized		0.005 N calcium sulfate (CaSO4)		

Consol Stage- Trial No.	Temp. ° C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	Dial Indicator in	Pressure Head Reading Mercury (inch)	Pressure Head Reading Gage (psi)	Flow Reading (cm)	Flow Vol (cm3) Rate (cm3/sec)	Fluid Head Reading Head (cm)	Fluid Head Reading Tail (cm)	Total Head Uncorrected Correction Corrected (cm)	Gradient	Permeability Preliminary Final at 20°C cm/sec
initial	20.7	5/14/03	00	00	00	105.0	100.0	0.414			3.80	64.108	68.00	38.40	29.60		
final	20.7	5/14/03	00	20	45						6.90	0.0515	68.00	38.40	11.08		1.42E-03
1	RT = 0.982	dT =		20.75 min		σ'_c =	0.7 ksf						68	38.4	18.52	1.83	1.42E-03
initial	20.7	5/14/03	00	00	00	105.0	100.0	0.414			4.60	47.564	68.00	38.40	29.60		
final	20.7	5/14/03	00	15	30						6.90	0.0511	68.00	38.40	11.00		1.41E-03
2	RT = 0.982	dT =		15.50 min		σ'_c =	0.7 ksf						68	38.4	18.60	1.84	1.40E-03
initial	20.7	5/14/03	00	00	00	105.0	100.0	0.414			3.50	66.176	68.00	38.40	29.60		
final	20.7	5/14/03	00	21	28						6.70	0.0514	68.00	38.40	11.05		1.42E-03
3	RT = 0.982	dT =		21.47 min		σ'_c =	0.7 ksf						68	38.4	18.55	1.83	1.41E-03
initial	20.7	5/14/03	00	00	00	105.0	100.0	0.414			4.30	70.312	68.00	38.40	29.60		
final	20.7	5/14/03	00	22	42						7.70	0.0516	68.00	38.40	11.10		1.43E-03
4	RT = 0.982	dT =		22.70 min		σ'_c =	0.7 ksf						68	38.4	18.50	1.83	1.42E-03

Preliminary Length/Area Calculations

Lo =	4.001	in	Lo=	10.162	cm
Ao=	3.088	in^2	Ao =	19.92	cm^2
Vo=	12.353	in^3	Vo =	202.44	cm^3
Lc =	10.126	cm	Vc =	200.31	cm^3
Ac=	19.782	cm^2	*m=*	*215.11*	

Tested By: DT Reviewed By: G. Thomas

TEST SUMMARY

Final Specimen and Test Conditions

Lc =	10.126	cm	ε_{axial} =	0.3%	
Ac =	19.522	cm^2			
Vc=	197.68	cm^3	ε_{vol} =	2.4%	

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	13.29	106.3	93.8	44.3
PreTest	28.43	123.4	96.1	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

Averages for trials: 1-4

ave K @ 20 °C: **1.41E-03** cm/sec

(i_o)ave = 1.83

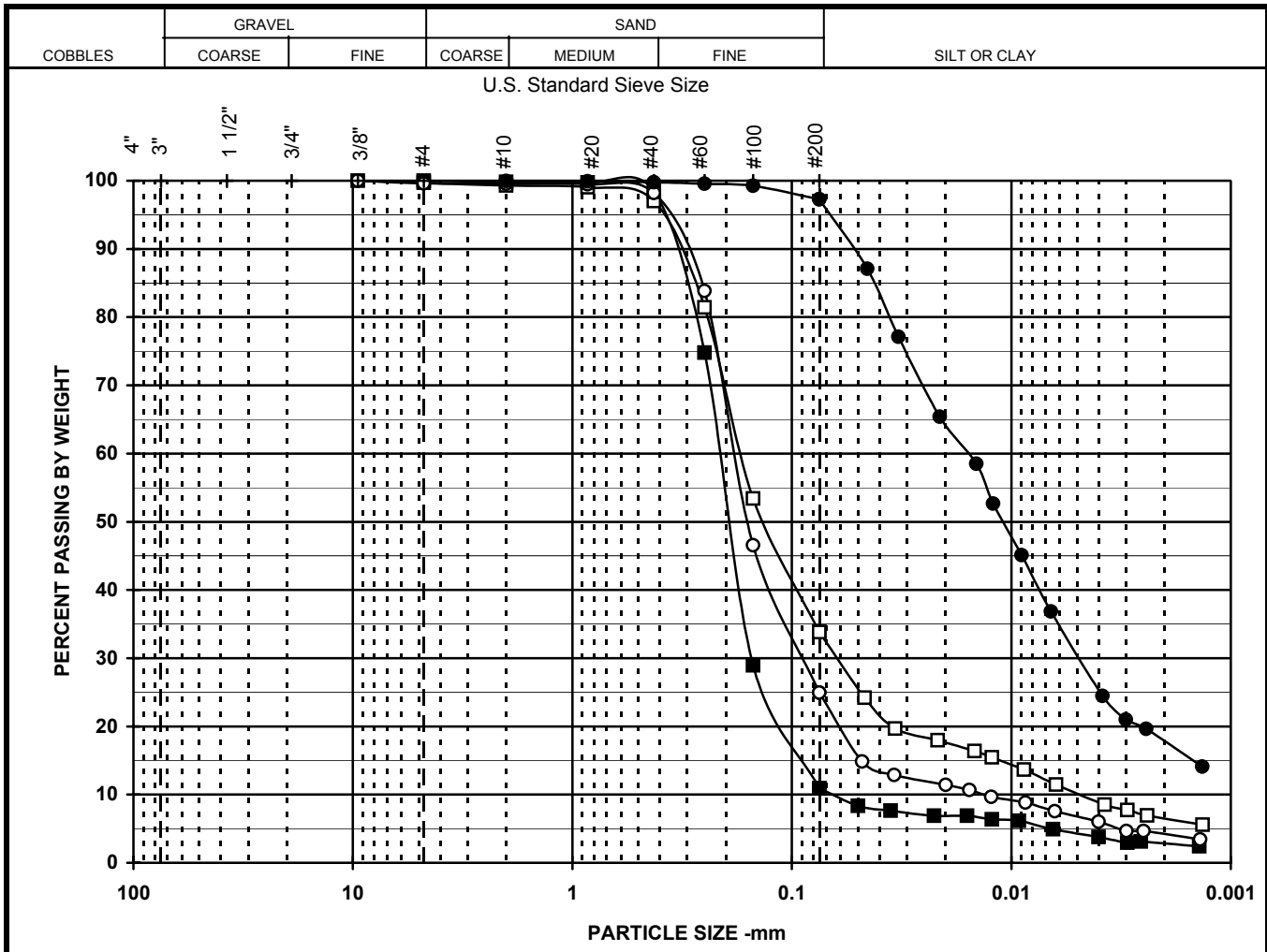
HYDRAULIC CONDUCTIVITY TEST

SWMU 54

LABORATORY TESTING DATA SUMMARY

BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS							REMARKS
			WATER CONTENT (%)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDROMETER % MINUS 2 μm (%)	ORGANIC CONTENT (burnoff) (%)	pH		
								Distilled Water	0.01 M CaCl Solution	
NR-SED-1			63.7	SM	33.8	7	4.7	7.1	6.1	
NR-SED-2			42.3	SP-SM	10.9	3	2.6	7.1	6.3	
NR-SED-3			51.6	SM	25.0	4	3.8	6.8	6.1	
NR-SED-4			173.0	CH	97.3	18	13.8	6.9	6.0	
NR-SED-5			96.5	MH	64.7	4	12.1	7.3	6.4	
NR-SED-6			107.0	CH	51.9	11	8.1	7.1	6.3	
NR-SED-7			95.7	CH	59.0	10	9.3	7.1	6.5	
NR-SED-8			48.6	SP-SM	9.8	2	12.6	7.2	6.3	
NR-SED-9			54.2	SM	22.8	5	3.6	6.9	6.3	
NR-SED-10			48.5	CL	51.6	13	4.7	6.9	6.1	
NR-SED-11			49.6	SM	32.6	6	4.5	6.4	5.6	
NR-SED-12			61.0	SM	24.4	4	4.6	6.4	5.5	
NR-SED-13			65.5	SM	15.3	4	3.8	5.8	5.5	
NR-SED-14			41.8	SM	14.4	4	3.3	6.8	5.8	
NR-SED-15			49.7	SC	34.4	6	4.3	6.4	5.5	
NR-SED-16			58.6	CH	69.1	21	8.7	6.6	6.0	
NR-SED-17			59.9	SC	24.2	5	5.4	7.0	6.2	
NR-SED-18			40.2	SM	22.2	4	3.0	6.5	5.6	
NR-SED-19			42.1	SP-SM	8.3	2	2.1	6.2	5.5	
NR-SED-20			43.5	SP-SM	9.0	2	1.6	6.7	6.0	
NR-SED-21			54.2	CH	51.4	16	7.3	7.1	6.5	
NR-SED-22			65.2	SC	40.3	7	6.6	6.2	5.7	
NR-SED-23			48.4	SC	50.0	12	5.6	6.6	5.9	

Note: (1) USCS symbol based on visual observation and Sieve reported.



SYMBOL	DESCRIPTION AND REMARKS
□	brown silty f. SAND, trace m. sand.
■	brown f. SAND, trace m. sand, silt.
○	brown f. SAND, some silt, trace m. sand.
●	brown CLAY, trace f. sand.

Symbol	□	■	○	●
Boring	NR-	NR-	NR-	NR-
Sample	SED-1	SED-2	SED-3	SED-4
Spec				
Depth				
% +3"				
% Gravel	0.3		0.4	
% SAND	65.9	89.1	74.6	2.7
% FINES	33.8	10.9	25.0	97.3
% -2μ	7	3	4	18
Cc		1.6		
Cu		3.3		
LL				
PL				
PI				
USCS	SM	SP-SM	SM	CH
w (%)				

Particle Size	PERCENT FINER			
(Sieve #)	□	■	○	●
4"				
3"				
1 1/2"				
3/4"				
3/8"	100.0		100.0	
4	99.7	100.0	99.6	
10	99.3	99.8	99.5	100.0
20	99.0	99.7	99.5	99.9
40	97.0	98.4	98.2	99.8
60	81.4	74.8	83.8	99.6
100	53.4	28.9	46.5	99.2
200	33.8	10.9	25.0	97.3

PARTICLE SIZE DISTRIBUTION
SWMU 54

Project No.		Figure
11656351	January 2007	

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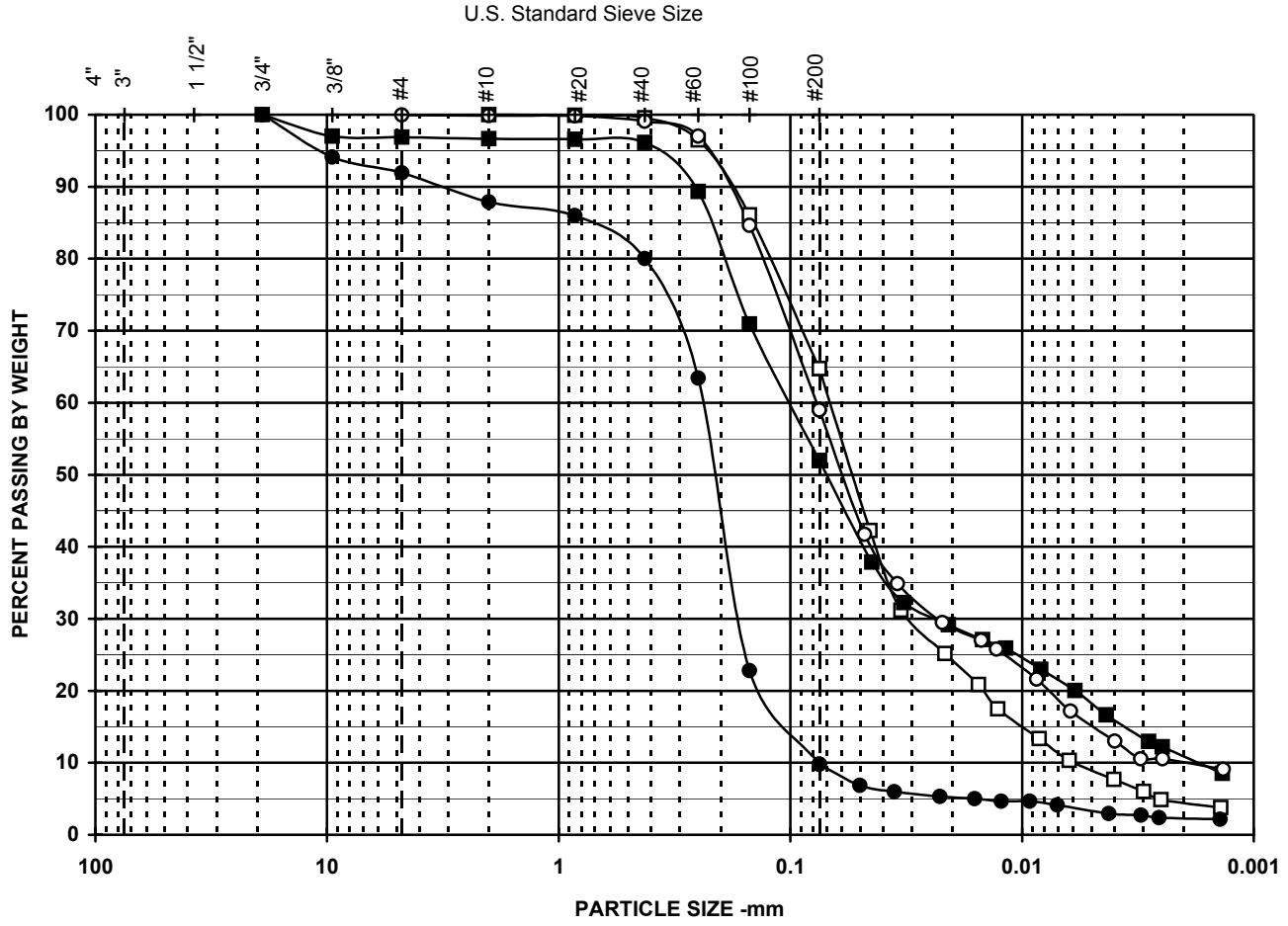
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	



SYMBOL	DESCRIPTION AND REMARKS
□	brown f. sandy clayey SILT.
■	brown c-f sandy silty CLAY, trace f. gravel.
○	brown f. sandy silty CLAY.
●	brown c-f SAND, trace f. gravel, silt.

Symbol	□	■	○	●
Boring	NR-	NR-	NR-	NR-
Sample	SED-5	SED-6	SED-7	SED-8
Spec				
Depth				
% +3"				
% Gravel		3.1		8.1
% SAND	35.3	45.0	41.0	82.1
% FINES	64.7	51.9	59.0	9.8
% -2μ	4	11	10	2
Cc				1.5
Cu				3.2
LL				
PL				
PI				
USCS	MH	CH	CH	SP-SM
w (%)				

Particle Size	PERCENT FINER			
(Sieve #)	□	■	○	●
4"				
3"				
1 1/2"				
3/4"		100.0		100.0
3/8"		97.0		94.1
4		96.9	100.0	91.9
10	100.0	96.7	99.9	87.9
20	99.9	96.6	99.8	86.0
40	99.5	96.1	99.1	80.0
60	96.5	89.3	97.0	63.4
100	86.1	70.9	84.6	22.8
200	64.7	51.9	59.0	9.8

PARTICLE SIZE DISTRIBUTION
SWMU 54

Project No.		Figure
11656351	January 2007	

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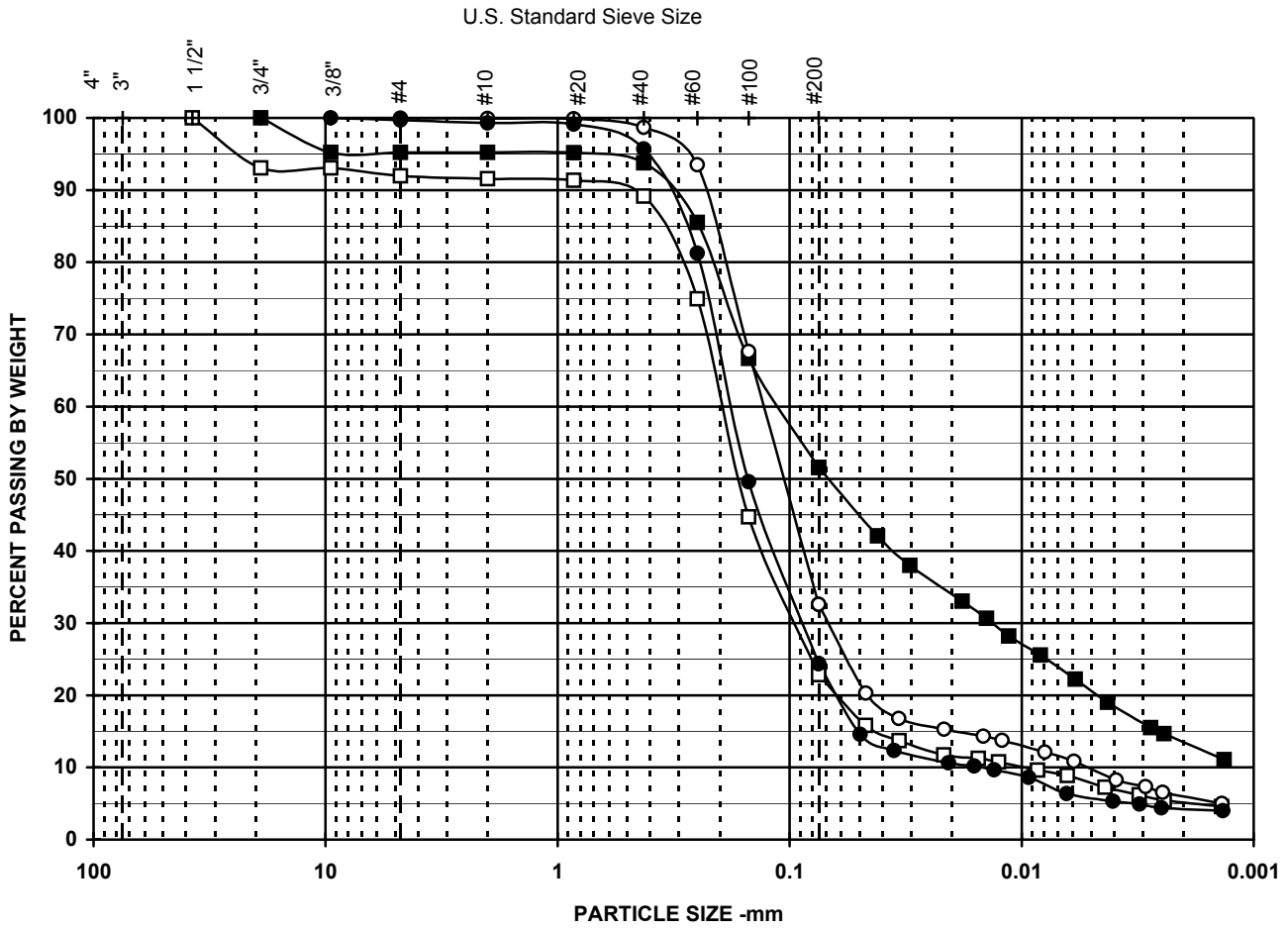


SYMBOL	DESCRIPTION AND REMARKS
□	brown m-f SAND, some silt, trace gravel, c. sand.
■	brown f. sandy silty CLAY, trace f. gravel, m. sand.
○	brown silty f. SAND, trace m. sand.
●	brown f. SAND, some silt, trace m. sand.

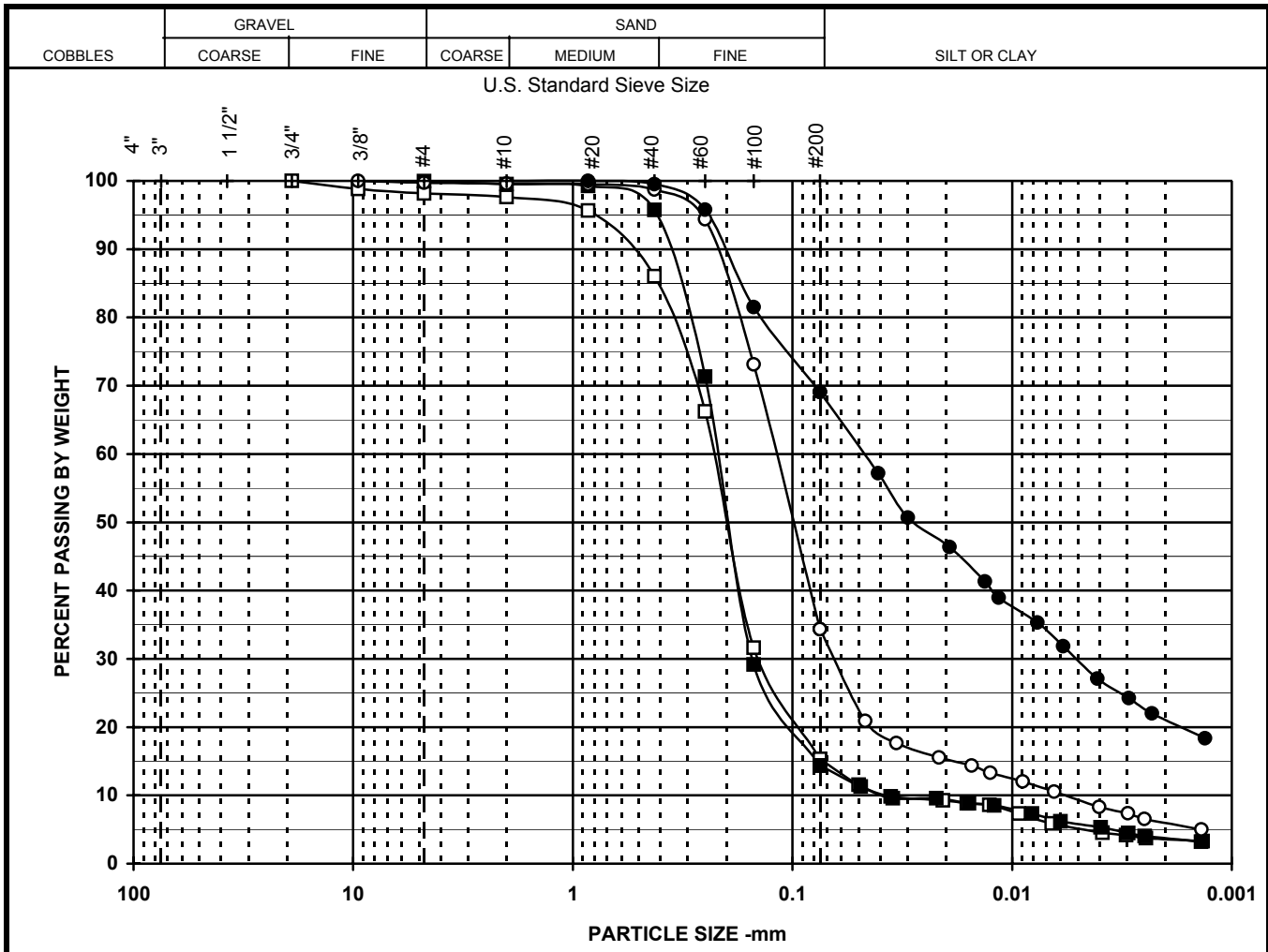
Symbol	□	■	○	●
Boring	NR-	NR-	NR-	NR-
Sample	SED-9	SED-10	SED-11	SED-12
Spec				
Depth				
% +3"				
% Gravel	8.0	4.8	0.0	0.3
% SAND	69.2	43.6	67.4	75.3
% FINES	22.8	51.6	32.6	24.4
% -2μ	5	13	6	4
Cc				
Cu				
LL				
PL				
PI				
USCS	SM	CL	SM	SM
w (%)				

Particle Size	PERCENT FINER			
(Sieve #)	□	■	○	●
4"				
3"				
1 1/2"	100.0			
3/4"	93.0	100.0		
3/8"	93.0	95.2		100.0
4	92.0	95.2	100.0	99.7
10	91.6	95.2	99.9	99.3
20	91.4	95.2	99.9	99.1
40	89.2	93.7	98.7	95.7
60	74.9	85.5	93.5	81.2
100	44.7	66.7	67.6	49.6
200	22.8	51.6	32.6	24.4

PARTICLE SIZE DISTRIBUTION
SWMU 54

Project No.		Figure
11656351	January 2007	

URS Corporation



SYMBOL	DESCRIPTION AND REMARKS
□	brown m-f SAND, some silt, trace f. gravel.
■	brown f. SAND, some silt, trace m. sand.
○	brown silty clayey f. SAND, trace m. sand.
●	brown f. sandy silty CLAY.

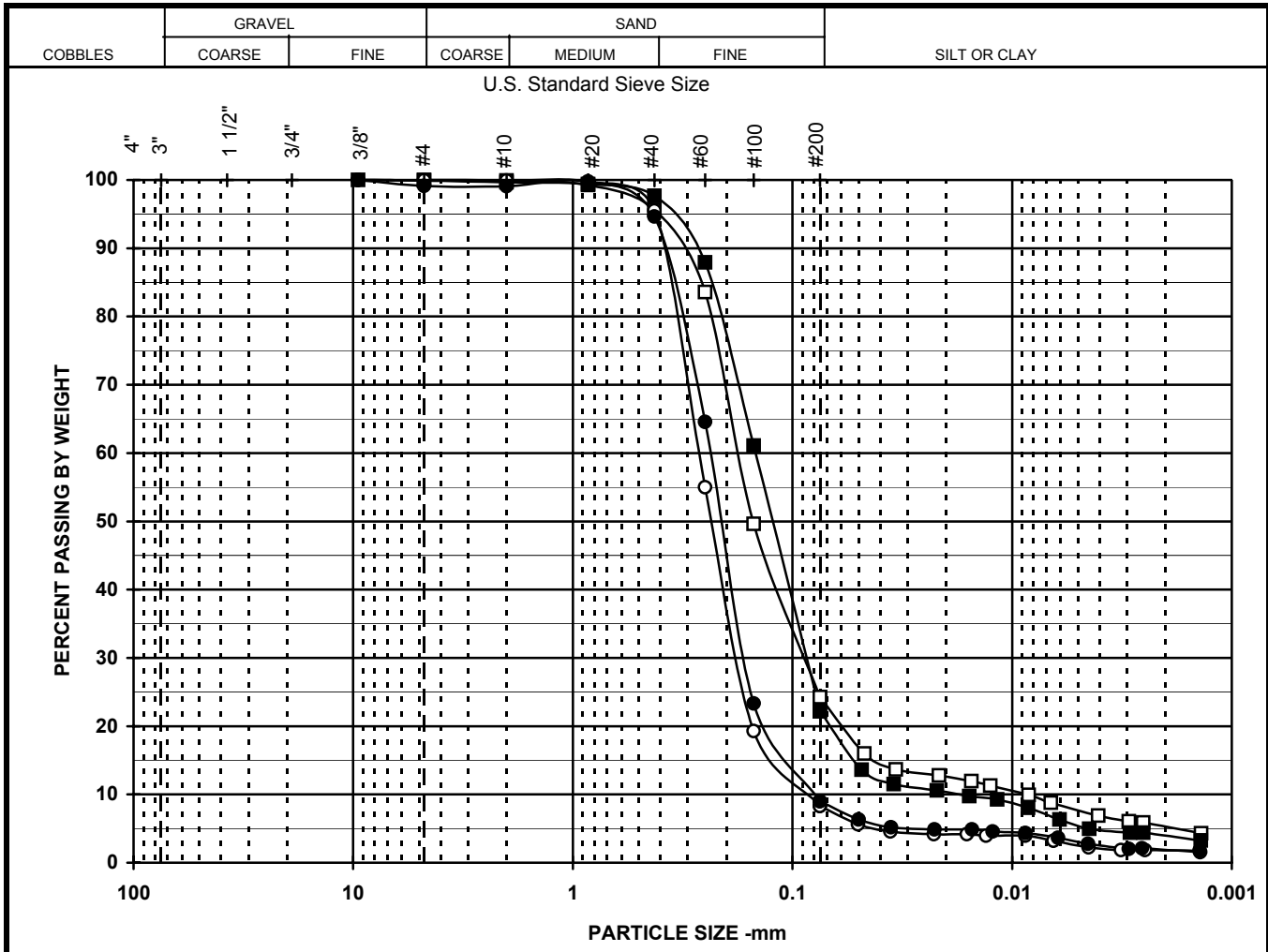
Symbol	□	■	○	●
Boring	NR-	NR-	NR-	NR-
Sample	SED-13	SED-14	SED-15	SED-16
Spec				
Depth				
% +3"				
% Gravel	1.9	0.0	0.3	
% SAND	82.8	85.6	65.3	30.9
% FINES	15.3	14.4	34.4	69.1
% -2μ	4	4	6	21
Cc				
Cu				
LL				
PL				
PI				
USCS	SM	SM	SC	CH
w (%)				

Particle Size	PERCENT FINER			
(Sieve #)	□	■	○	●
4"				
3"				
1 1/2"				
3/4"	100.0			
3/8"	98.8		100.0	
4	98.1	100.0	99.7	
10	97.6	99.5	99.6	
20	95.6	99.2	99.5	100.0
40	86.0	95.7	98.7	99.5
60	66.2	71.3	94.4	95.8
100	31.6	29.2	73.1	81.5
200	15.3	14.4	34.4	69.1

PARTICLE SIZE DISTRIBUTION
SWMU 54

Project No.		Figure
11656351	January 2007	

URS Corporation



SYMBOL	DESCRIPTION AND REMARKS
□	brown f. SAND, some silty clay, trace m. sand.
■	brown f. SAND, some silt, trace m. sand.
○	brown f. SAND, trace m. sand, silt.
●	brown f. SAND, trace m. sand, silt.

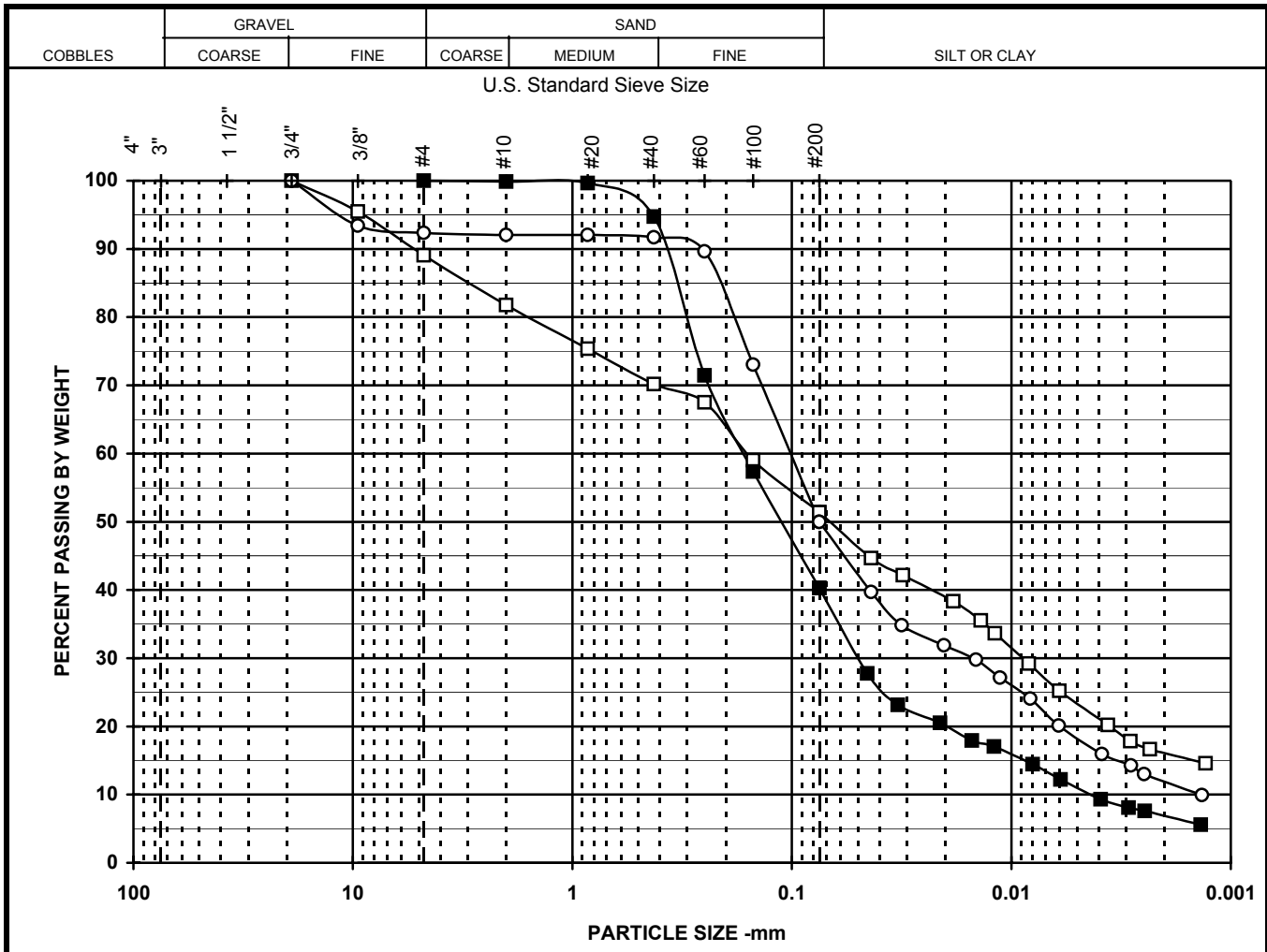
Symbol	□	■	○	●
Boring	NR-	NR-	NR-	NR-
Sample	SED-17	SED-18	SED-19	SED-20
Spec				
Depth				
% +3"				
% Gravel		0.1	0.1	0.9
% SAND	75.8	77.7	91.6	90.1
% FINES	24.2	22.2	8.3	9.0
% -2μ	5	4	2	2
Cc			1.4	1.4
Cu			3.1	3.0
LL				
PL				
PI				
USCS	SC	SM	SP-SM	SP-SM
w (%)				

Particle Size	PERCENT FINER			
(Sieve #)	□	■	○	●
4"				
3"				
1 1/2"				
3/4"				
3/8"		100.0	100.0	100.0
4	100.0	99.9	99.9	99.1
10	99.9	99.7	99.9	99.1
20	99.3	99.4	99.7	99.8
40	95.6	97.7	95.5	94.7
60	83.6	87.9	55.0	64.6
100	49.6	61.1	19.3	23.3
200	24.2	22.2	8.3	9.0

PARTICLE SIZE DISTRIBUTION
SWMU 54

Project No.		Figure
11656351	January 2007	

URS Corporation



SYMBOL	DESCRIPTION AND REMARKS
□	brown c-f sandy CLAY, trace f. gravel.
■	brown silty clayey f. SAND, trace m. sand.
○	brown silty clayey f. SAND, trace f. gravel; shells noted.
●	

Symbol	□	■	○	●
Boring	NR-	NR-	NR-	
Sample	SED-21	SED-22	SED-23	
Spec				
Depth				
% +3"				
% Gravel	10.9		7.6	
% SAND	37.7	59.7	42.4	
% FINES	51.4	40.3	50.0	
% -2μ	16	7	12	
Cc				
Cu				
LL				
PL				
PI				
USCS	CH	SC	SC	
w (%)	54.2			

Particle Size	PERCENT FINER			
(Sieve #)	□	■	○	●
4"				
3"				
1 1/2"				
3/4"	100.0		100.0	
3/8"	95.5		93.4	
4	89.1	100.0	92.4	
10	81.8	99.9	92.1	
20	75.4	99.7	92.0	
40	70.2	94.7	91.7	
60	67.5	71.4	89.6	
100	59.0	57.4	73.0	
200	51.4	40.3	50.0	

PARTICLE SIZE DISTRIBUTION
SWMU 54

Project No.		
11656351	January 2007	Figure

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APPENDIX C.2

PREVIOUS INVESTIGATION BORING LOGS

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BORING 54MW1

Surface Elevation: 0
Location: Radford AAP, Virginia
Start: 08:25 on 11-5-91
Finish: 09:05 on 11-6-91

Depth (Feet)	Sampling Method	Sample No.	Blows/Foot	Core Run No.	% Recovery	RQD %	Sample Interval	Symbols	Description
0	SPT	1	19		20			ML	DARK BROWN (7.5YR 3/4) FINE SANDY SILT, DRY, STIFF, WITH ROOT MATERIAL
								SM	DARK BROWN (7.5YR 4/4), SILTY FINE SAND, SLIGHTLY MOIST, SLIGHTLY CLAYEY, MICACEOUS, MEDIUM DENSE, TRACE RED MOTTLING
5	SPT	2	27		100				LESS CLAY, MORE MICACEOUS OCCASIONAL THIN SAND SEAMS
10	SPT	3	11		85				
15	SPT	4	18		85				SOME ONE-INCH POCKETS OB BLACK, COALY MOTTLING
	AH	5							GRAVELLY AND COBBLY FROM 18.5 TO TOP OF WEATHERED SHALE
20	AH	6						SH/SLTST	GREENISH GRAY (5GY 5/1) WEATHERED SILTSTONE AND SHALE
									GREENISH GRAY (5BG 5/1), SOFT SILTY SHALE
	AH	7							GREENISH GRAY (5BG 5/1), SOFT SILTY SHALE
25									
	AH	8							WITH INTERBEDDED LAYERS OF GRAY (N/4) DOLOSTONE/ LIMESTONE
30	AH	9						SH/SLTST/LS	GRAY (N/5) VERY SILTY SHALE AND DOLOSTONE/ LIMESTONE
35	AH	10							BECOMING VERY SLIGHTLY MOIST (CUTTINGS ARE COHESIVE)
40									

PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 54MW1 (Cont'd)

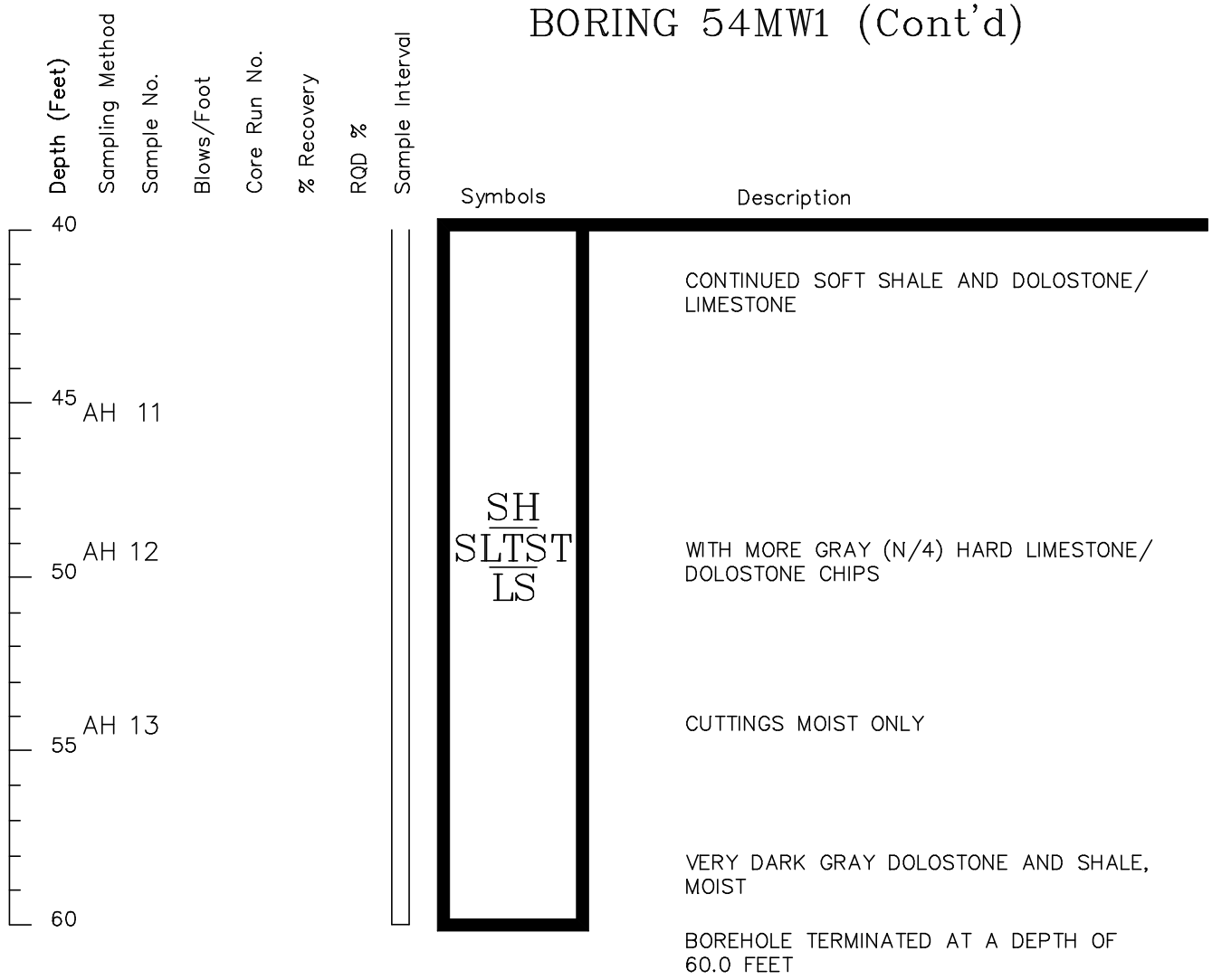


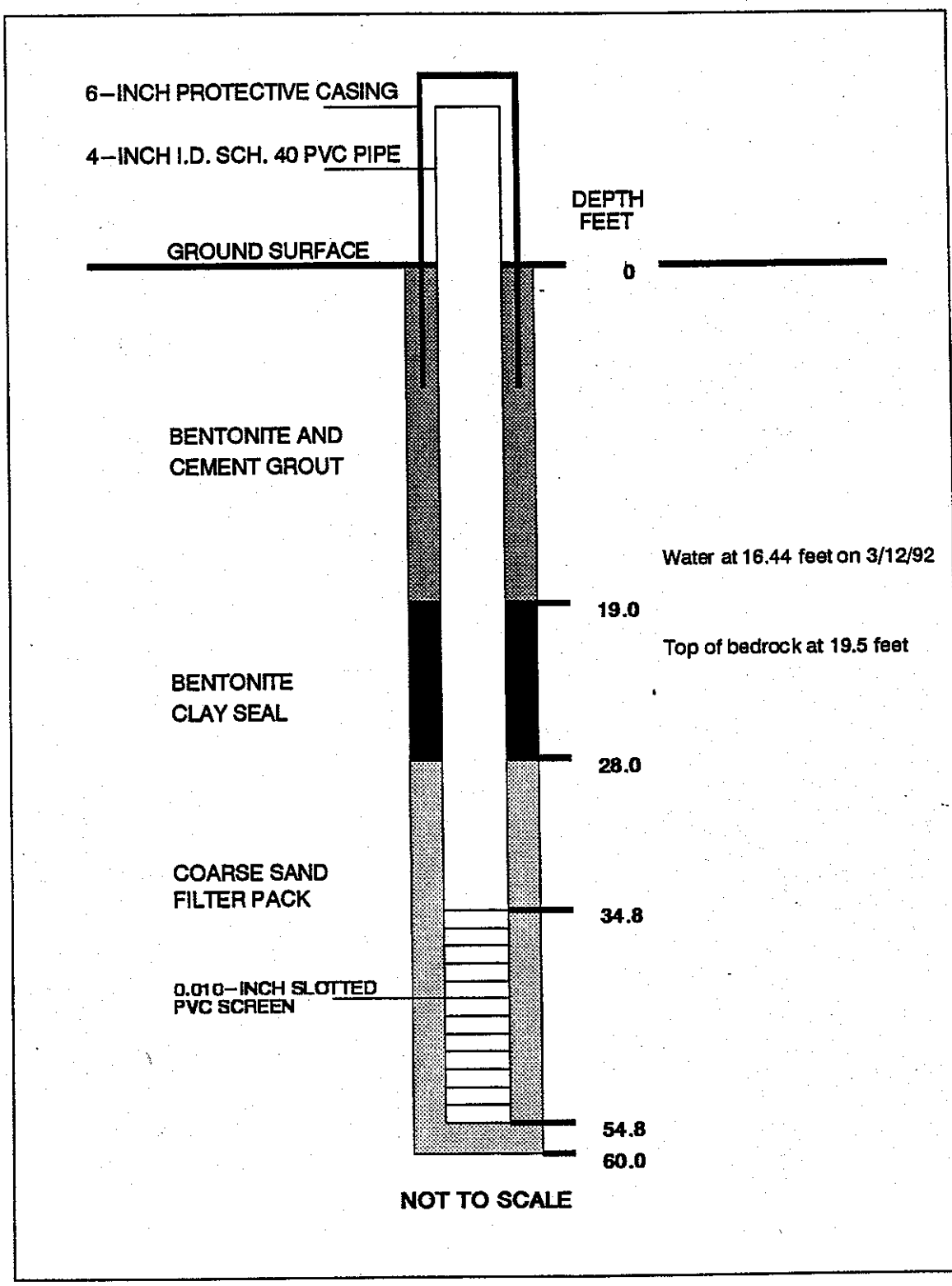
PLATE
LOG OF BORING

Dames & Moore

FILE

WELL INSTALLATION DIAGRAM
FOR VERIFICATION INVESTIGATION
RADFORD AAP, VIRGINIA

Location: 54MW1
Installation Date: 11/6/91
Surface Elevation: 1705.7 Feet
Top of PVC Elevation: 1707.78 Feet



Dames & Moore

BORING 54MW1A

Surface Elevation: 0
Location: Radford AAP, Virginia
Start: 08:25 on 9-16-91
Finish: 09:05 on 9-17-91

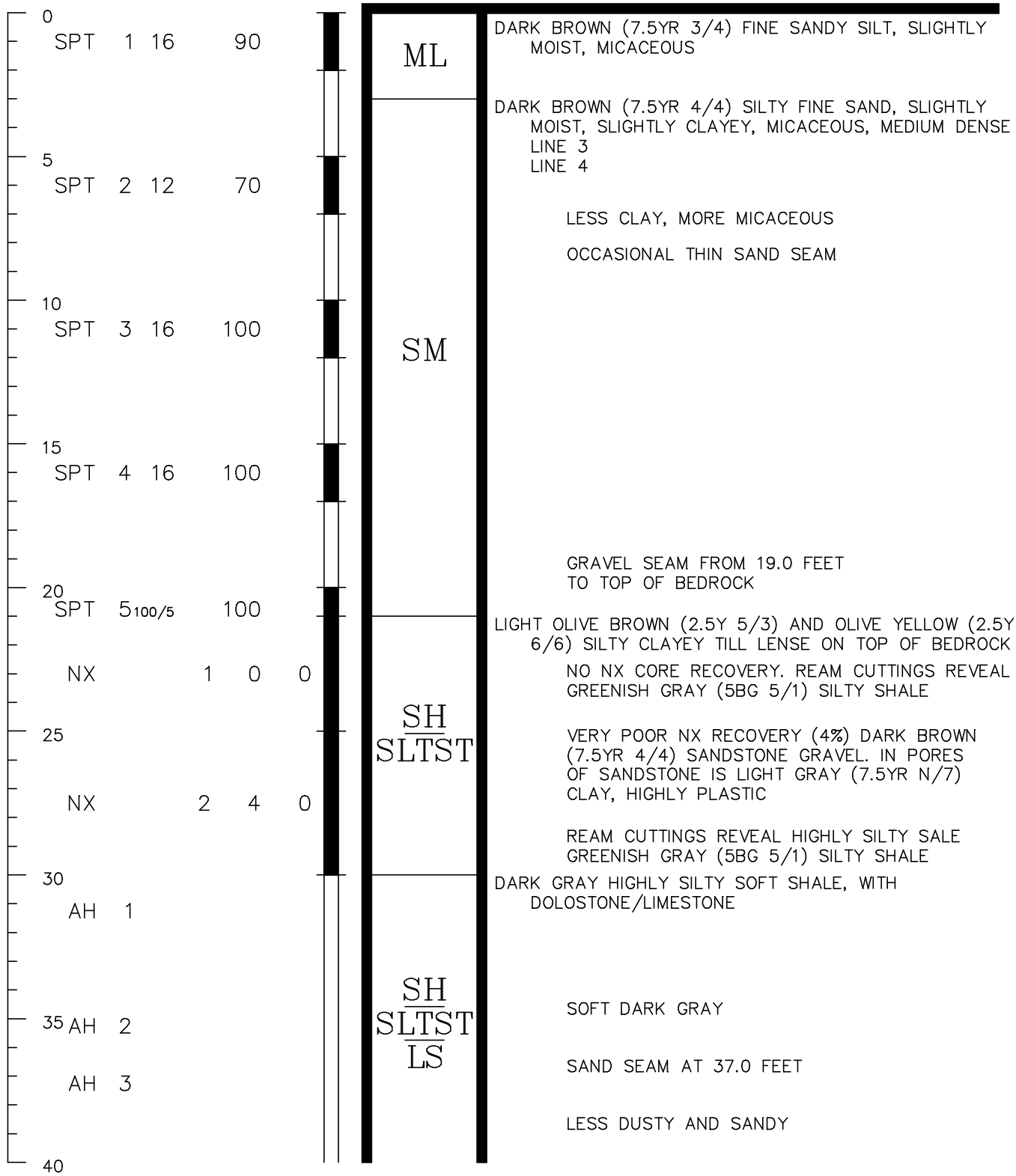


PLATE
LOG OF BORING

Dames & Moore

FILE

BORING 54MW1A (Cont'd)

Depth (Feet)	Sampling Method	Sample No.	Blows/Foot	Core Run No.	% Recovery	RQD %	Sample Interval	Symbols	Description
40									
	AH	4						SH / SLTST / LS	CUTTINGS SLIGHTLY MORE MOIST, COHESIVE, SILTY
									WITH SOME LIGHT GRAY DOLOSTONE CHIPS
45	AH	5						LS / SLTST / LS	
									WITH ABUNDANT LIGHT GRAY LIMESTONE AND DOLOSTONE CHIPS
50	AH	6							GRAY SANDY SILT—PROBABLE FAULT GOUGE
									BORING TERMINATED AT A DEPTH OF 52.0 FEET
55									

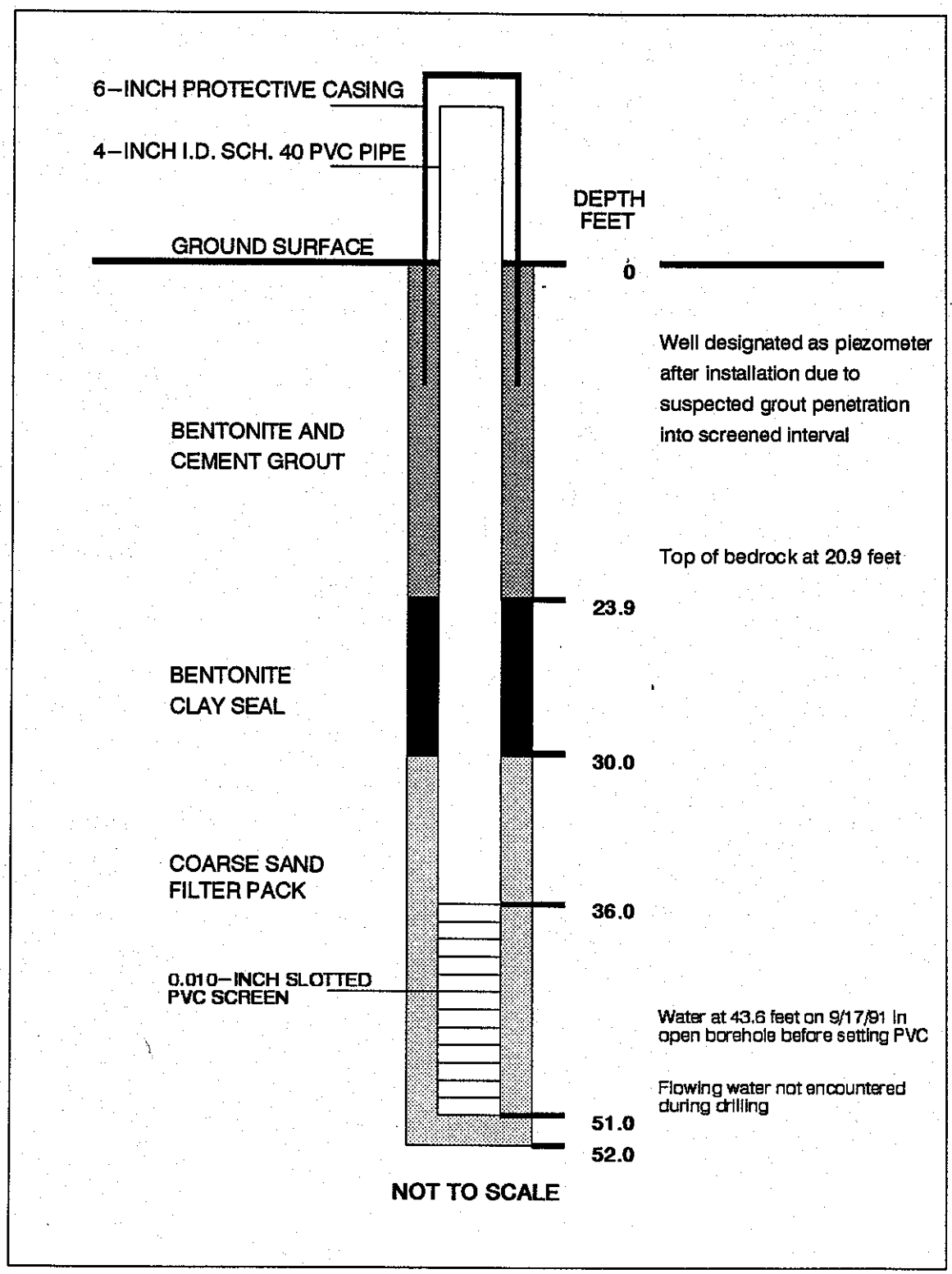
PLATE
LOG OF BORING

Dames & Moore

FILE

PIEZOMETER INSTALLATION DIAGRAM FOR VERIFICATION INVESTIGATION RADFORD AAP, VIRGINIA

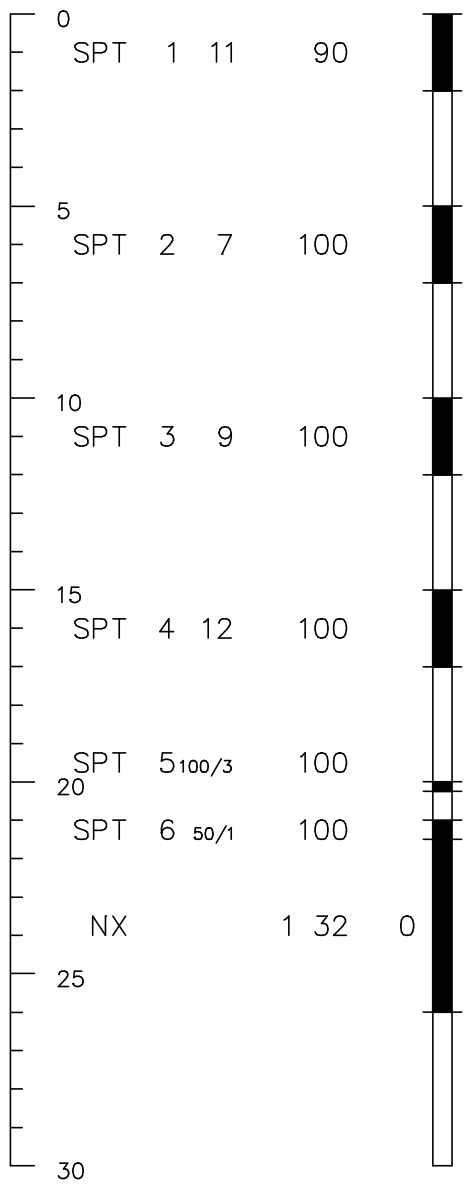
Location: 54MW1A
Installation Date: 9/17/91
Surface Elevation: 1704 Feet*
Top of PVC Elevation: 1705 Feet*
*Estimated, not surveyed



Dames & Moore

BORING 54MW2

Surface Elevation: 0
Location: Radford AAP, Virginia
Start: 10:20 on 9-17-91
Finish: 14:45 on 9-17-91



Symbols	Description
	DARK BROWN (7.5YR 3/3) SILTY FINE GRAINED SAND, SLIGHTLY MOIST, MICACEOUS, LOOSE
	BECOMING MORE MICACEOUS
	MOISTURE AND SILT INCREASING WITH DEPTH
SM	OCCASIONAL SILTY OR CLAYEY LINSES OR SEAMS
	15.5–16.0 FEET SILTY CLAY SEAMS
	MOIST
	THIN BROWN (10YR 5/3) SANDY GRAVELLY SEAM
	DARK GRAY (7.5YR N/4) INTERBEDDED, HIGHLY WEATHERED SHALE AND LIMESTONE WITH DARK BROWN (10YR 4/3) STAINING, HIGHLY FRACTURED
SH/LS	GREENISH GRAY (5G 6/1) HIGHLY WEATHERED, HIGHLY FRACTURED SHALE, WITH MANY THIN CALCITE VEINS, ROCK FRAGMENTS ARE HARD
	BOREHOLE TERMINATED AT A DEPTH OF 30.0 FEET

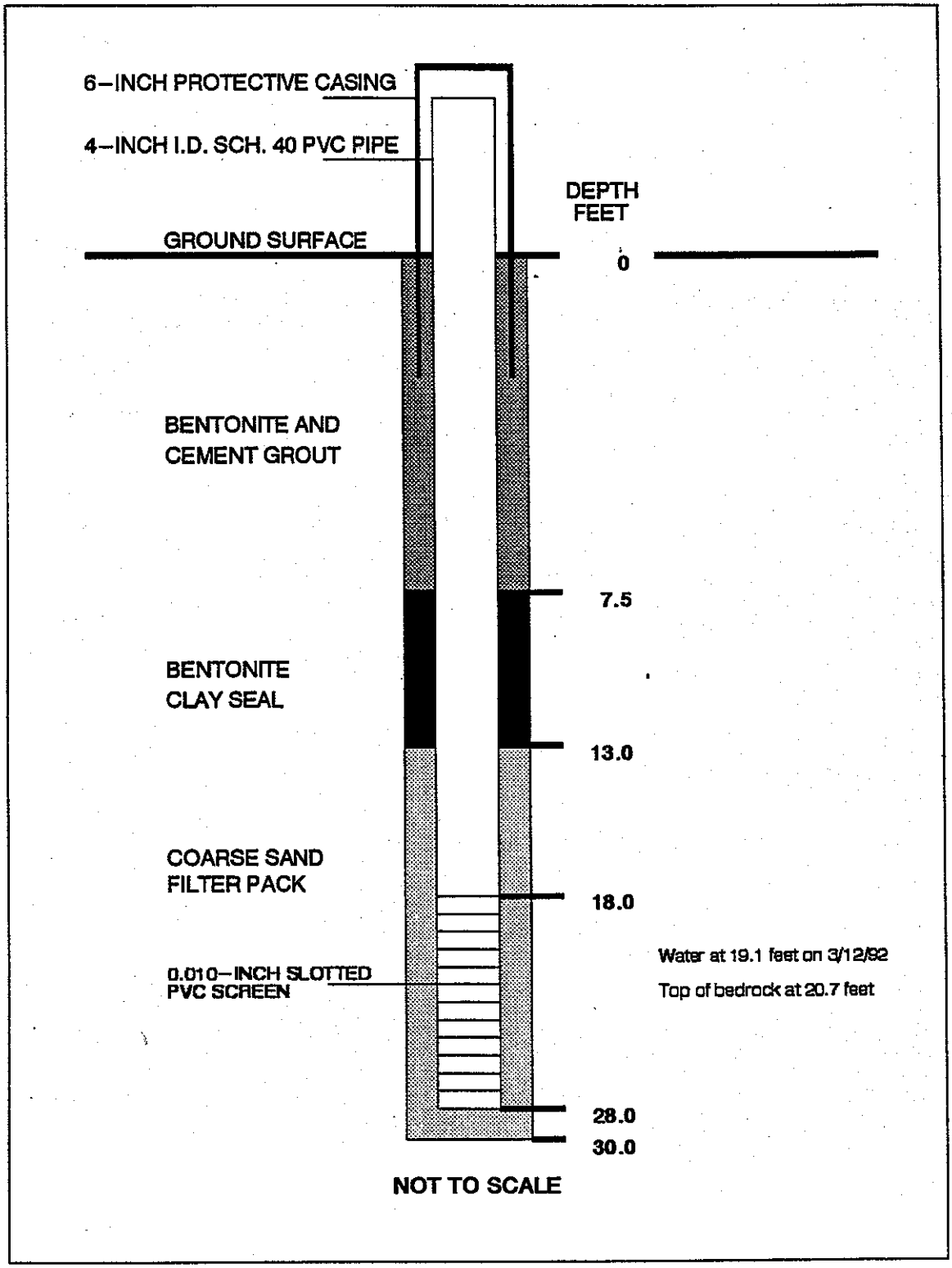
PLATE
LOG OF BORING

Dames & Moore

FILE

WELL INSTALLATION DIAGRAM
FOR VERIFICATION INVESTIGATION
RADFORD AAP, VIRGINIA

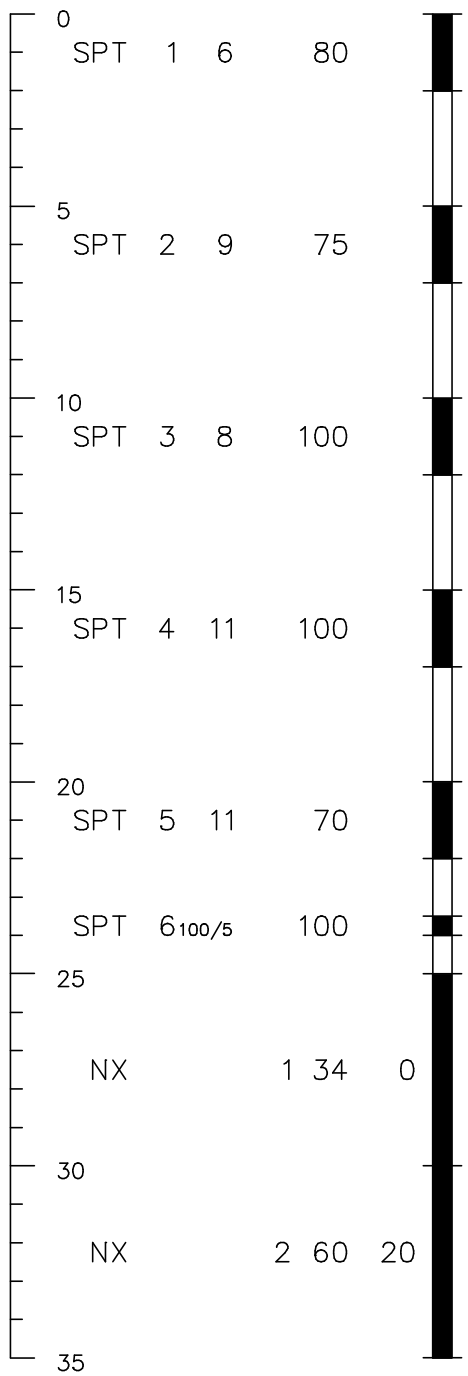
Location: 54MW2
Installation Date: 9/17/91
Surface Elevation: 1698.9 Feet
Top of PVC Elevation: 1701.41 Feet



Dames & Moore

BORING 54MW3

Surface Elevation: 0
Location: Radford AAP, Virginia
Start: 07:21 on 9-18-91
Finish: 11:42 on 9-18-91



Symbols	Description
SM	DARK BROWN (7.5YR 3/3) SILTY FINE SAND, SLIGHTLY MOIST, MICACEOUS, LOOSE
	BECOMING MORE MICACEOUS
	MOISTURE AND SILT INCREASING WITH DEPTH
	OCCASIONAL CLAYEY SAND LENSES OR SEAMS
	OCCASIONAL SAND (LITTLE FINES) LENSES OR SEAMS
	HIGH-CLAY OR HIGH-SILT LENSES FREQUENT
	THIN GRAYISH BROWN SAND SEAM 20.0-21.0 FEET
GM	GRAYISH BROWN (10YR 5/2) SILTY SANDY GRAVEL, VERY MOIST TO WET
	GRAY (10YR 5/1) SILT SEAM TOP OF ROCK
SH/LS	DARK GRAY SILTY SHALE, 10YR 4/1, WITH SOFT LIMESTONE INCLUSIONS, HIGHLY WEATHERED , HIGHLY FRACTURED, WITH OCCASIONAL GRAVEL SEAMS. POOR RECOVERY
	BECOMES SOFTER, DARKER, VERY THINLY BEDDED, CLAYEY COOLY SILTSTONE
SH/LS	VERY DARK GRAY 10YR 3/1, HARD, CEMENTED, BRECCIATED LIMESTONE TO 32.3 FEET, BECOMING HIGHLY FRACTURED, CRACKED, SHARPLY ANGULAR LIMESTONE AND SHALE PIECES WITH VERY THIN CALCITE VEINS
	BOREHOLE TERMINATED AT A DEPTH OF 35.0 FEET

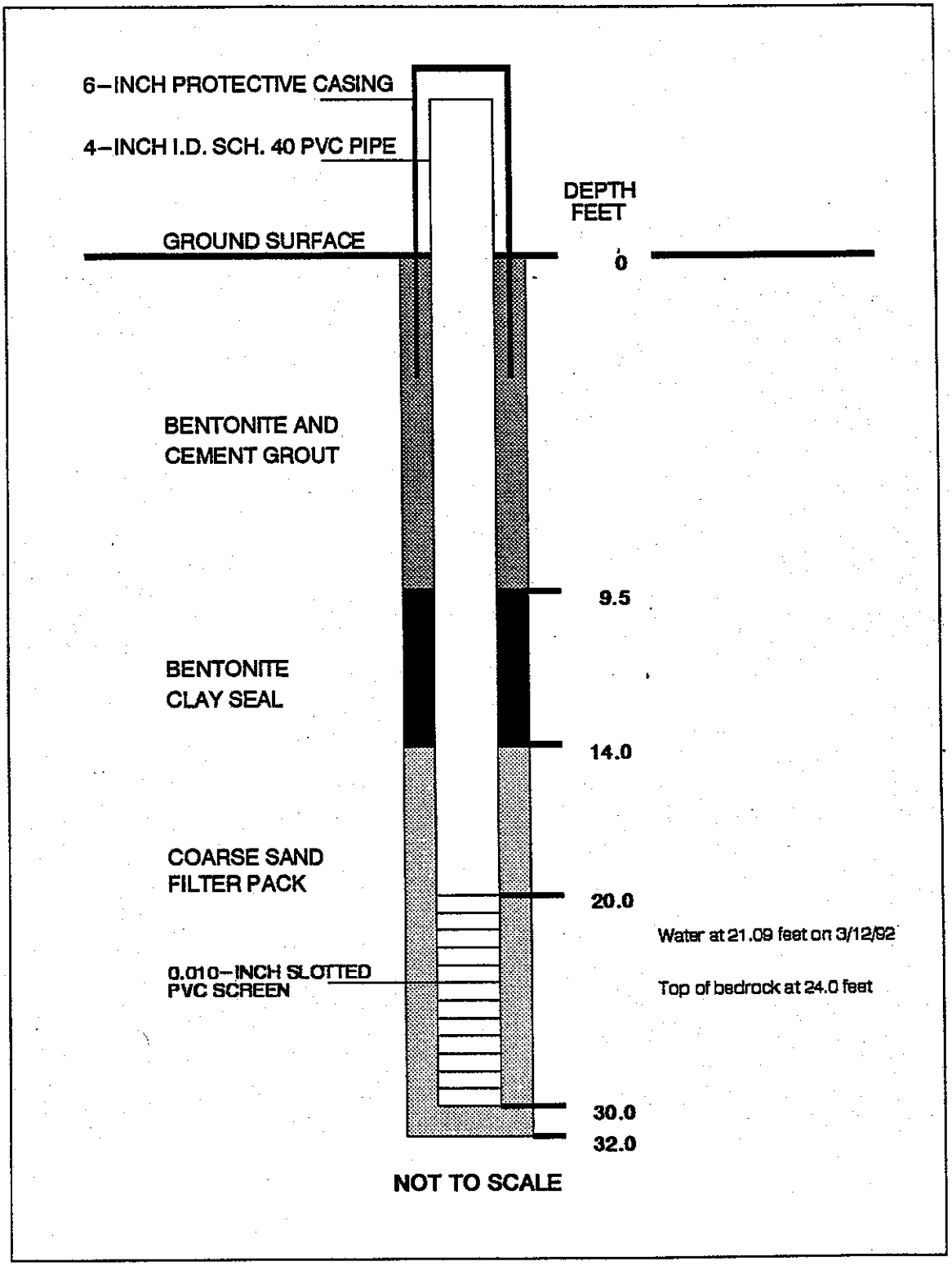
PLATE
LOG OF BORING

Dames & Moore

FILE

WELL INSTALLATION DIAGRAM
FOR VERIFICATION INVESTIGATION
RADFORD AAP, VIRGINIA

Location: 54MW3
Installation Date: 9/18/91
Surface Elevation: 1700.6 Feet
Top of PVC Elevation: 1702.15 Feet



Dames & Moore

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB1

LOCATION: SWMU 54 SOUTH OF LOWER MOUND

WEATHER: COLD, 30° F

DATE/TIME START: 12/20/94 1610

DATE/TIME FINISH: 12/20/94 1700

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1	1*	85	3,5 6,8	5.9	SS	SS 0-2'		SILT, SOME CLAY, LITTLE SAND, DARK BROWN, POSSIBLE ASH OR STAINING AT 2 FEET
3	2	80	4,6 9,9	5.8	SS	SS 2-4'		
6	3	85	6,7 7,9	5.3	SS	SS 5-7'	ML	
11	4	90	4,5 7,8	5.2	SS	SS 10-12'		
16	5	90	10,7 37,32	4.9	HS	SS 15-17'	SM	SAND, SOME SILT, DARK BROWN, MOIST
							GM	GRAVEL, SOME SILT, DAMP
							SLSN	SILTSTONE, WEATHERED, GRAY
21	6*	90	28,40 100/5	6.0	HS	SS 20-22'	LMSN	LIMESTONE, WEATHERED, GREEN-GRAY
								END OF BORING AT 22 FEET

LITHOLOGIC COLUMN

WELL COMPLETION: SURFACE ELEVATION 1697.3' (MSL)

DEPTH (FT)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB2

LOCATION: SWMU 54
SOUTH OF LOWER MOUND

WEATHER: COLD, 30° F

DATE/TIME START: 12/21/94 0945

DATE/TIME FINISH: 12/21/94 1030

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1	1*	50	6,4 4,9	7.0	HS	SS 0-2'		SILT, SOME CLAY, LITTLE SAND, DARK BROWN
3	2	70	10,5 6,10	7.9	SS	SS 2-4'		
6	3	90	2,3 4,3	8.7	SS	SS 5-7'	ML	
11	4	90	3,6 6,5	8.9	SS	SS 10-12'		
16	5*	90	1,2 2,1	8.2	SS	SS 15-17'		
20							GM	GRAVEL, SOME SILT, WET
21	6	60	22,38 35 50/2	4.6	SS	SS 20-22'	SLSN	SILTSTONE, WEATHERED, GRAY
22								END OF BORING AT 22 FEET

LITHOLOGIC COLUMN

WELL COMPLETION: SURFACE ELEVATION 1699.1' (MSL)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB3

LOCATION: SWMU 54 WEST OF LOWER MOUND

WEATHER: COLD, 30° F.

DATE/TIME START: 12/21/94 1036

DATE/TIME FINISH: 12/21/94 1110

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1-2	1*	75	5,6 6,6	1.6	HS	SS 0-2'	ML	SILT, SOME CLAY, DARK BROWN
3-4	2	75	6,6 6,4	1.5	HS	SS 2-4'		
5-7	3	70	2,3 3,5	1.9	HS	SS 5-7'		
8-10								
11-12	4	95	8,10 11,5	1.9	HS	SS 10-12'	SM	SILT AND SAND, LITTLE CLAY, BROWN
13-15								
16-17	5*	40	5,13 24,32	2.0	HS	SS 15-17'	GM	GRAVEL, SOME SILT, WET
18-19	6	60	45,52 REF.	9.8	SS	SS 18-19'	LMSN	LIMESTONE, WEATHERED, GREEN-GRAY, WET
20-26								END OF BORING AT 19.5 FEET

LITHOLOGIC COLUMN

WELL COMPLETION: SURFACE ELEVATION 1696.6' (MSL)

DEPTH (FT)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB4

LOCATION: SWMU 54
WEST OF LOWER MOUND

WEATHER: COLD, 35° F

DATE/TIME START: 12/21/94 1120

DATE/TIME FINISH: 12/21/94 1152

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FT)
1	1*	90	3,4 5,4	3.4	HS	SS 0-2'		SILT AND CLAY, LITTLE SAND, DARK BROWN		SURFACE ELEVATION 1697.0' (MSL)	1
2											2
3	2	95	4,5 8,8	3.2	HS	SS 2-4'	ML				3
4											4
5											5
6	3	95	6,7 7,9	4.8	HS	SS 5-7'		CLAY AND SILT, SOME SAND, LIGHT BROWN			6
7											7
8							CL/ML				8
9											9
10											10
11	4	90	2,3 2,2	4.9	HS	SS 10-12'		SAND, LITTLE SILT, BROWN, MEDIUM COARSE			11
12											12
13							SW				13
14											14
15											15
16	5*	60	2,2 3,8	4.0	HS	SS 15-17'	SM	SAND AND SILT, SOME CLAY, MOIST, BROWN			16
17											17
18	6	10	50/2	2.1	SS	SS 18-19'	GM	GRAVEL, OVER WEATHERED, GREEN-GRAY LIMESTONE, WET			18
19								END OF BORING AT 18.5 FEET			19
20											20
21											21
22											22
23											23
24											24
25											25
26											26

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING
GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB5

LOCATION: SWMU 54
N. CENTER OF LOWER MOUND

WEATHER: COLD, 35° F

DATE/TIME START: 12/21/94 1204

DATE/TIME FINISH: 12/21/94 1225

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1	1*	100	3,2 3,4	9.7	HS	SS 0-2'		SILT, SOME CLAY, LITTLE SAND, DARK BROWN
6	2	90	4,4 7,8	4.7	HS	SS 5-7'	ML	
11	3	95	9,3 4,6	6.5	HS	SS 10-12'		
16	4*	90	4,3 2,3	5.3	HS	SS 15-17'	SM	SILT AND SAND, BROWN
18							GM	GRAVEL, WET
								END OF BORING AT 18 FEET

LITHOLOGIC COLUMN

WELL COMPLETION: SURFACE ELEVATION 1697.0' (MSL)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING
GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB6

LOCATION: SWMU 54
CENTER OF LOWER MOUND

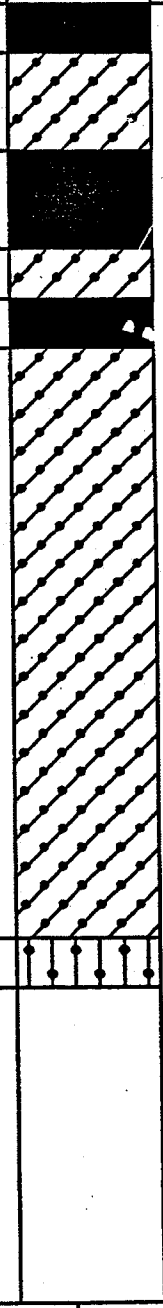
WEATHER: CLOUDY, 45° F

DATE/TIME START: 12/22/94 1100

DATE/TIME FINISH: 12/22/94 1200

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
0-1							ASH	ASH, GLASSY, BLACK
1-2								
2-3	1*	50	NA	32.0	HS	MOSS SPOON 0-5'	SM	SILT AND SAND, LITTLE CLAY, BROWN
3-4								
4-5							ASH	ASH, GLASSY, BLACK
5-6							SM	SILT AND SAND, RED-BROWN
6-7							ASH	ASH, GLASSY, BLACK-BROWN
7-8	2	50	NA	6.0	HS	MOSS SPOON 5-10'	SM	SILT AND SAND, SOME CLAY, DARK BROWN, LESS CLAY AT BOTTOM, MOIST
8-9								
9-10								
10-11								
11-12								
12-13	3*	90	NA	6.5	HS	MOSS SPOON 10-15'		
13-14								
14-15								
15-16								
16-17								
17-18	4	75	NA	5.0	HS	MOSS SPOON 15-20'		
18-19								
19-20							GM	GRAVEL, SOME SILT, WET
20-21								END OF BORING AT 20 FEET
21-22								
22-23								
23-24								
24-25								
25-26								

LITHOLOGIC COLUMN



WELL COMPLETION

DEPTH (FT)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE

▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING
GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB7

LOCATION: SWMU 54 EAST OF LOWER MOUND

WEATHER: WARM, 50° F

DATE/TIME START: 12/22/94 1215

DATE/TIME FINISH: 12/22/94 1255

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1	1*	90	2,3 4,7	0.0	HS	SS 0-2'	ML	SILT, SOME SAND, LITTLE CLAY, DARK BROWN
6	2	95	7,4 4,2	0.0	HS	SS 5-7'	SM	SAND AND SILT, LITLE CLAY, BROWN, MORE CLAY TOWARD 16 FEET
11	3	90	4,8 9,7	5.0	SS	SS 10-12'		
16	4*	80	1,1 2,3	2.5	SS	SS 15-17'	ML	SILT AND CLAY, SOME SAND, DARK BROWN
21	5	90	4,10 19,15	0.2	SS	SS 20-22'	SW	SAND, LITTLE SILT, BROWN, MEDIUM COARSE
							GM	GRAVEL, SAND AND SILT, WET
24							LMSN	LIMESTONE, WEATHERED, GRAY
								END OF BORING AT 24 FEET

LITHOLOGIC COLUMN

WELL COMPLETION: SURFACE ELEVATION 1700.1' (MSL)

DEPTH (FT)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB8

LOCATION: SWMU 54 EAST OF LOWER MOUND

WEATHER: WARM, 50° F

DATE/TIME START: 12/22/94 1320

DATE/TIME FINISH: 12/22/94 1355

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1	1*	60	2,2 3,3	9.0	HS	SS 0-2'	ML	SILT, SOME CLAY, DARK BROWN
6	2	90	5,5 4,2	2.1	HS	SS 5-7'	SM	SILT AND SAND, LITLE CLAY, BROWN, MOIST, MORE SAND WITH DEPTH
11	3	90	1,2 2,2	4.8	HS	SS 10-12'		
16	4*	100	6,5 6,5	5.9	SS	SS 15-17'		
18							ML	SILT AND CLAY, DARK BROWN, MOIST
21	5	50	15,11 11, 50/2	2.5	SS	SS 20-22'	GM	GRAVEL, WET, OVER WEATHERED LIMESTONE, GRAY
22								END OF BORING AT 22 FEET

LITHOLOGIC COLUMN

WELL COMPLETION: SURFACE ELEVATION 1699.4' (MSL)

DEPTH (FT)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB9

LOCATION: SWMU 54
NORTH OF LOWER MOUND

WEATHER: COLD, 30° F

DATE/TIME START: 12/21/94 1235

DATE/TIME FINISH: 12/21/94 1305

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1	1	90	3,4 6,5	4.2	SS	SS 0-2'		SILT AND CLAY, SOME SAND, BLACK-BROWN (ASH?)
6	2*	85	2,3 4,4	48.0	HS	SS 5-7'	ML	
11	3	50	1,2 2,4	0.0	HS	SS 10-12'		
16	4*	90	2,3 3,3	0.0	HS	SS 15-17'		
17							SW	SAND, BROWN, MEDIUM COARSE
18							GM	GRAVEL, SILT, WET
20	5	10	50/2	0.0	HS	SS 20-21'	LMSN	LIMESTONE, WEATHERED, GREEN-GRAY
21								END OF BORING AT 21 FEET

LITHOLOGIC COLUMN

WELL COMPLETION: SURFACE ELEVATION 1697.9' (MSL)

DEPTH (FT)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING
GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB10

LOCATION: SWMU 54
WEST OF UPPER MOUND

WEATHER: COLD, 30° F

DATE/TIME START: 12/21/94 1310

DATE/TIME FINISH: 12/21/94 1340

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1	1	50	2,4 6,8	0.0	HS	SS 0-2'	ML	SILT, SOME CLAY, DARK-BROWN
6	2*	90	6,7 7,6	0.0	HS	SS 5-7'		
11	3	75	2,6 7,9	0.2	HS	SS 10-12'	SM	SAND, LITTLE SILT, BROWN
16	4*	75	2,3 6,13	0.0	HS	SS 15-17'		
17							GM	GRAVEL, SILT
18	5	25	100/5	0.0	HS	SS 18-19'	LMSN	LIMESTONE, WEATHERED, GRAY, WET
19								END OF BORING AT 19 FEET

LITHOLOGIC COLUMN

WELL COMPLETION

SURFACE ELEVATION 1696.6' (MSL)

DEPTH (FT)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE

▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING
GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB11

LOCATION: SWMU 54 WEST OF UPPER MOUND

WEATHER: COLD, 35° F

DATE/TIME START: 12/21/94 1350

DATE/TIME FINISH: 12/21/94 1418

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FT)
1-2	1*	70	2,2 3,2	2.6	HS	SS 0-2'	ML	SILT, SOME CLAY, LITTLE SAND, DARK-BROWN		SURFACE ELEVATION 1697.3' (MSL)	1-2
3-4	2	90	2,4 5,4	0.0	HS	SS 2-4'					3-4
5-6	3	90	5,5 6,5	0.0	HS	SS 5-7'	SM	SILT, SOME SAND, LITTLE CLAY, BROWN			5-6
7-8											7-8
9-10											9-10
11-12	4	95	5,5 5,6	0.6	HS	SS 10-12'					11-12
13-14											13-14
15-16	5*	80	2,2 3,2	0.0	HS	SS 15-17'					15-16
17							GM	GRAVEL, SILT, WET			17
18								AUGER REFUSAL AT 18 FEET			18
19-20											19-20
21-22											21-22
23-24											23-24
25-26											25-26

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE

▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB12

LOCATION: SWMU 54
NORTHWEST OF UPPER MOUND

WEATHER: COLD, 35° F

DATE/TIME START: 12/21/94 1500

DATE/TIME FINISH: 12/21/94 1540

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FT)
1-2	1*	90	2,2 3,2	2.8	HS	SS 0-2'	ML	SILT AND CLAY, DARK-BROWN		SURFACE ELEVATION 1696.8' (MSL)	
3-4	2	100	3,5 7,6	1.7	HS	SS 2-4'					
5-7	3	90	3,8 5,5	0.8	HS	SS 5-7'	CL/ML	CLAY AND SILT, DARK BROWN, MOIST AT 16 FEET			
10-12	4	95	2,2 2,2	0.8	HS	SS 10-12'					
15-17	5*	90	2,3 3,5	0.0	HS	SS 15-17'	SM	SAND AND SILT, LIGHT BROWN			
18							GM	GRAVEL OVER LIMESTONE, WET			
18-20	6	10	100/6	0.0	HS	SS 18-19'		AUGER REFUSAL AT 18 FEET			

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE

▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING
GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB13

LOCATION: SWMU 54 EAST OF UPPER MOUND

WEATHER: COLD, 35° F

DATE/TIME START: 12/21/94 1550

DATE/TIME FINISH: 12/21/94 1645

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1-2	1*	85	2,2 2,3	0.0	HS	SS 0-2'	ML	SILT, SOME CLAY, LITTLE SAND, DARK-BROWN
3-4	2	80	2,4 4,3	0.0	HS	SS 2-4'		
5-6	3	90	4,6 7,8	0.0	HS	SS 5-7'	SM	SILT AND SAND, LITTLE CLAY, BROWN
7-8								
9-10								
11-12	4	90	1,1 1,1	0.0	HS	SS 10-12'	CL/ML	SILT AND CLAY, LITTLE SAND, DARK BROWN
13-14								
15-16	5	85	2,5 5,4	0.0	HS	SS 15-17'	ML	SILT, SOME CLAY AND SAND, BROWN
17-18								
19-20								
21-22	6*	80	2,2 13,8	0.0	HS	SS 20-22'	SM	SAND AND SILT, BROWN, MOIST
23-24	7	50	19,13 52/2	0.0	HS	SS 22-24'	GM	GRAVEL, WET
							LMSN	LIMESTONE, WEATHERED, GREEN-GRAY
25-26								END OF BORING AT 24 FEET

LITHOLOGIC COLUMN

WELL COMPLETION: SURFACE ELEVATION 1700.0' (MSL)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB14

LOCATION: SWMU 54 NORTHEAST OF UPPER MOUND

WEATHER: WARM, 40° F

DATE/TIME START: 12/22/94 0830

DATE/TIME FINISH: 12/22/94 0910

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1-5	1*	55	NA	1.7	HS	MOSS SPOON 0-5'	ML	SILT, SOME SAND, LITTLE CLAY, DARK-BROWN
5-10	2	95	NA	6.0	HS	MOSS SPOON 5-10'	SM	SAND AND SILT, LITTLE CLAY, BROWN
10-15	3*	75	NA	5.6	HS	MOSS SPOON 10-15'		
15-20	4	5	NA	1.4	HS	MOSS SPOON 15-20'		
20							GM	GRAVEL OVER LIMESTONE, WET
21								AUGER REFUSAL AT 21 FEET

LITHOLOGIC COLUMN

WELL COMPLETION: SURFACE ELEVATION 1899.6' (MSL)

DEPTH (FT)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING
GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HAND AUGERED

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB15

LOCATION: SWMU 54
CENTER OF UPPER MOUND

WEATHER: WARM, 40° F

DATE/TIME START: 12/22/94 1100

DATE/TIME FINISH: 12/22/94 1130

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS	LITHOLOGIC COLUMN	WELL COMPLETION	DEPTH (FT)
0-4							ML	SILT, LITTLE CLAY, BROWN		SURFACE ELEVATION 1704.5' (MSL)	
4-5							ASH	ASH, GLASSY BLACK, AND BROWN SILT			
5-8							ML	SILT, LITTLE CLAY, BROWN			
8								END OF BORING AT 8 FEET * 4-6 FEET INTERVAL SUBMITTED TO LAB NOTE: NO PID READINGS ABOVE BACKGROUND RECORDED			

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
HAND AUGERED
GROUTED TO SURFACE

CONTRACTOR: CT & E

GEOLOGIST: BACHOVCHIN/GLENNIE

DRILLING METHOD: HSA

DTW FROM TOC: NA

DATE/TIME: NA

PARSONS ENGINEERING-SCIENCE, INC. DRILLING RECORD

PROJECT NAME: RAAP

CLIENT: US AEC

PROJECT NO.: 722843

BORING NO: 54SB16

LOCATION: SWMU 54
N. OF UPPER MOUND (BACKGROUND)

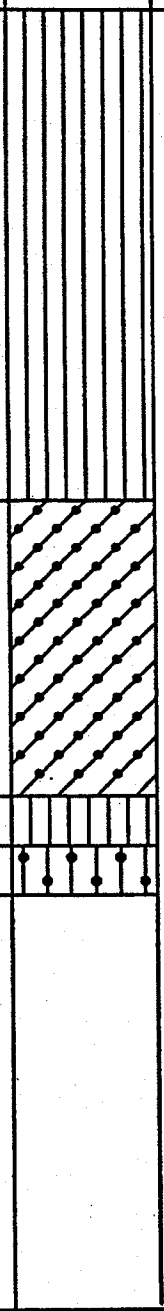
WEATHER: WARM, 45° F

DATE/TIME START: 12/22/94 0940

DATE/TIME FINISH: 12/22/94 1005

DEPTH (FT)	SAMPLE ID	RECOVERY %	BLOW COUNT	PID (ppm)	READING AT	SAMPLE TYPE	USCS	LITHOLOGY/REMARKS
1	1*	90	2,2 2,3	27.1	HS	SS 0-2'	ML	SILT, SOME CLAY, LITTLE SAND, DARK-BROWN
6	2	80	3,3 4,6	7.4	SS	SS 5-7'		
11	3*	80	4,6 7,6	15.9	HS	SS 10-12'	SM	SAND AND SILT, LITTLE CLAY, MEDIUM BROWN
16	4	90	1,1 2,4	2.8	SS	SS 15-17'	ML	SILT AND CLAY, DARK BROWN
17							GM	GRAVEL, SOME SILT, WET
18								AUGER REFUSAL AT 18 FEET

LITHOLOGIC COLUMN



WELL COMPLETION

SURFACE ELEVATION 1697.0' (MSL)

HSA = HOLLOW STEM AUGER
CAL = CALIBRATION
USCS = UNIFIED SOIL CLASS. SYS.

SS = SPLIT SPOON
A = AUGER CUTTINGS
* = LAB SAMPLE

BH = BORE HOLE
GS = GRAB SAMPLE

HS = HEADSPACE
▽ = WATER LEVEL

COMMENTS:
4 INCH DIAMETER BORING GROUTED TO SURFACE

APPENDIX C.3

RCRA FACILITY INVESTIGATION
BORING LOGS

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB17

Sheet 1 of 1

Date(s) Drilled	**12/02/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.35**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/4, dark brown, fine SAND, poorly graded, moist, trace silt, loose, micaceous, homogeneous	Sample 54SB17A collected from 0-1 ft bgs.
	1								
1695									
	2		1	3.4	ND				
								Grading to 7.5YR 5/4, brown	
	3						SM		
	4							4.0-7.0 ft bgs; 7.5YR 4/4, brown, SILTY fine SAND, moist, micaceous, loose	
	5								
	6		2	4.0	ND				
1690									
	7							7.5YR 4/4, brown, CLAYEY SAND, moist, homogeneous	
	8						SC		
	9		3	2.0	ND				Sample 54SB17B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1685									
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB17

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB18

Sheet 1 of 1

Date(s) Drilled	**12/02/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1698.98**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 4/4, brown, SILTY fine SAND, moist, micaceous, loose, homogeneous	Sample 54SB18A collected from 0-1 ft bgs.
	1								
	2		1	2.9	ND				
	3						SM		
1695	4								
	5								
	6		2	2.9	ND			5.5-7.0 ft bgs; 7.5YR 4/6, strong brown, fine, SILTY SAND, some clay, micaceous, some clay	
	7							7.5YR 4/6, strong brown, CLAYEY fine SAND, wet	
	8						SC		
1690	9		3	2.0	ND				Sample 54SB18B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 feet bgs.	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB18

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB19

Sheet 1 of 1

Date(s) Drilled	**12/02/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.15**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 4/4, brown, SILTY fine SAND, moist, micaceous, trace clay, loose, homogeneous	Sample 54SB19A collected from 0-1 ft bgs.
1695	1								
	2		1	3.7	ND				
	3								
	4								
	5						SM	5.0-8.0 ft bgs; 7.5YR 4/4, brown, SANDY fine SILT, trace clay, moist, soft, slight elasticity	
1690	6		2	3.2	ND				
	7								
	8							8.0-10.0 ft bgs; 7.5YR 4/4, brown, SILTY fine SAND, moist	
	9		3	2.0	ND				Sample 54SB19B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
1685	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB19

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB20

Sheet 1 of 1

Date(s) Drilled	**12/02/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1698.88**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/4, dark brown, SILTY fine SAND, moist, homogenous, trace clay	Sample 54SB20A collected from 0-1 ft bgs.
	1								
	2		1	3.5	ND				
	3								
1695	4						SM		
	5								
	6		2	3.2	ND				
	7							6.5-10.0 ft bgs; 7.5YR 4/6, strong brown, SILTY very fine SAND, trace clay, moist	
	8								
1690	9		3	2.0	ND			Increasing clay, slight plasticity	Sample 54SB20B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB20

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB21

Sheet 1 of 1

Date(s) Drilled	**12/02/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.04**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 4/3, brown, CLAYEY SILT, trace sand, moist, soft, slight plasticity	Samples 54SB21A collected from 0-1 ft bgs.
1695	1								
	2		1	3.6	ND		ML	2.0-4.0 ft bgs; 7.5YR 4/6, strong brown, fine SANDY SILT, trace clay, trace gravel, moist, highly micaceous	
	3								
	4							Interbedded layers of 7.5YR 3/4, dark brown, fine SANDY SILT, soft, and 7.5YR 4/6, strong brown, SILTY fine SAND, loose, moist	
	5								
1690	6		2	3.4	ND				
	7						SM		
	8								
	9		3	2.0	ND				Samples 54SB21B and Duplicate collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
1685	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB21

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB22

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.98**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/3, dark brown, very fine SANDY SILT, moist, soft, micaceous	Sample 54SB22A sample collected from 0-1 ft bgs.
	1								
1695	2		1	4.0	ND			Grading to 7.5YR 4/4, brown, increasing fine sand, moist	
	3								
	4								
	5						ML	Increasing elasticity	
	6		2	4.0	ND				
1690	7								
	8							Occasional clayey silt lenses	
	9		3	2.0	ND				Sample 54SB22B sample collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1685	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB22

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB23

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1699.31**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						ML	7.5YR3/4, dark brown, CLAYEY SILT, trace fine sand, moist, stiff, micaceous	Sample 54SB23A collected at 0-1 ft bgs.
	1							7.5YR4/6, strong brown, SILTY fine SAND, moist, hard, micaceous, homogeneous	
	2		1	3.4	ND				
	3								
	4							4.0-10.0 ft bgs; Some gravel	
1695									
	5						SM		
	6		2	3.6	ND				
	7								
	8							Grading to less gravels	
	9		3	2.0	ND				Samples 54SB23B and MS/MSD collected at 9-10 ft bgs.
1690									
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB23

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB24

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.17**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						SC	7.5YR4/6, strong brown, SANDY CLAY, moist, plastic, micaceous	Sample 54SB24A collected at 0-1 ft bgs.
								0.2-0.3 ft bgs; Fine pea gravel and fill layer	
	1							7.5YR4/6, strong brown, SILTY fine SAND, moist, micaceous, homogeneous	
1695									
	2		1	4.0				2.2 ft bgs; Loose gravel inclusion	
	3							2.8 ft bgs; Loose gravel inclusion	
	4							Grading to trace clay, cohesive	
	5						SM		
								Grading to homogeneous	
1690	6		2	4.0					
	7								
	8								
	9		3	2.0					Sample 54SB24B collected at 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
1685	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB24

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB25

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.66**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 5/6, strong brown, SILTY CLAY, moist, stiff, slight plasticity, fill soil	Sample 54SB25A collected from 0-1 ft bgs.
	1								
1695									
	2		1	4.0	ND				
	3								
	4						FILL		
	5								
	6		2	2.2	ND				
1690									
	7								
	8								
	9		3	2.0	ND		SM	7.5YR 4/4, brown, SILTY fine SAND, moist, cohesive, micaceous, Black material at 9.2	Sample 54SB25B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1685									
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB25

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB26

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1698.88**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/3, dark brown, fine SAND, trace silt, moist, loose, micaceous, homogeneous	Sample 54SB26A collected from 0-1 ft bgs.
	1								
	2		1	3.4	ND				
	3								
1695	4							4.0 ft bgs; 7.5YR 4/6, brown, SILTY fine SAND, moist, loose	
	5						SM		
	6		2	3.4	ND				
	7								
	8							Grading to trace clay, plastic, moist	
1690	9		3	2.0	ND				Samples 54SB26B and Duplicate collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB26

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB27

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.56**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						SC	7.5YR 4/4, brown, CLAYEY SAND, slight plasticity, moist, stiff Fill soil	Sample 54SB27A collected from 0-1 ft bgs.
	1						GM	7.5YR 4/4, brown, SANDY GRAVEL, trace silt, moist	
1695								7.5YR 4/4, SILTY fine SAND, moist, micaceous, homogeous, loose	
	2		1	3.6	ND				
	3								
	4								
	5								
	6		2	3.0	ND		SM		
1690									
	7								
	8								
	9		3	2.0	ND				Sample 54SB27B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1685									
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB27

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB28

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1697.68**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						SC	7.5YR 4/6, strong brown, SANDY CLAY, moist, fat, slight plasticity	Sample 54SB28A collected from 0-1 ft bgs.
	1								
	2		1	2.8	ND		SM	7.5YR 3/4, dark brown, SILTY fine SAND, micaceous, homogeneous, loose to very loose, moist	
1695	3								
	4								
	5							5.0-7.5 ft bgs; 7.5YR 4/4, brown, SILTY fine SAND, moist, micaceous, soft, loose	
	6		2	4.0	ND				
	7								
1690								Grading to 7.5YR 3/4, dark brown, increasing silt and clay, cohesive	
	8								Sample 54SB28B collected from 8-10 ft bgs.
	9		3	2.0	ND				
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB28

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB29

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1698.88**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/4, dark brown, SILTY fine SAND, moist, micaceous, homogeneous, loose	Sample 54SB29A collected from 0-1 ft bgs.
	1								
	2		1	3.2	ND			Grading to 7.5YR 4/6, strong brown, less silt, moist	
	3								
1695	4								
	5						SM		
	6		2	3.5	ND				
	7								
	8							Grading to 7.5YR 3/4, dark brown, moist	
1690	9		3	2.0	ND				Sample 54SB29B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB29

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB30

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.76**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 4/6, strong brown, SILTY fine SAND, moist, loose, micaceous, homogeneous	Sample 54SB30A collected from 0-1 ft bgs.
	1								
1695	2		1	2.3	ND				
								2.5 ft bgs; Black cinder and ash layer	
	3								
	4							4.0 ft bgs; 7.5YR 4/4, brown, SILTY fine SAND, moist, soft, micaceous, homogeneous, cohesive	
	5						SM		
	6		2	2.0	ND				
1690								6.5 ft bgs; Large rounded gravel layer	
	7								
	8							8.0 ft bgs; Wood chips	
	9		3	1.5	ND				Sample 54SB30B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1685	12								

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB31

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1697.87**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							5YR4/6, yellowish red, fine SANDY CLAY, trace fine to medium angular gravel, moist, stiff	Sample 54SB31A collected at 0-1 ft bgs.
	1								
	2		1	3.4	ND				
1695	3						CL	Grading to less clay	
	4								
	5							5YR4/6, yellowish red, SILTY SAND, with occasional fine to medium angular gravel, homogeneous, soft, cohesive, moist	
	6		2	3.3	ND				
	7								
1690	8						SM		
	9		3	2.0	ND				Samples 54SB31B and Duplicate collected at 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB31

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB32

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1699.07**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR5/8, strong brown, CLAYEY SILT, moist, non-elastic, hard, micaceous	Sample 54SB32A collected at 0-1 ft bgs.
	1						ML		
	2		1	3.0	ND			7.5YR4/6, strong brown, fine, SILTY fine SAND, moist, dense, Manganese Oxide (MnO) at 2.0 ft bgs	
	3							2.6 ft bgs; MnO 2.9 ft bgs; MnO	
1695	4							4.0 ft bgs; Trace gravel	
	5							4.8 ft bgs; MnO	
	6		2	3.5	ND		SM		
	7							6.6 ft bgs; MnO	
	8								
1690	9		3	2.0	ND			9.5 ft bgs; MnO	Sample 54SB32B collected 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB32

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB33

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.44**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						CL	7.5YR5/8, strong brown, SANDY fine CLAY, moist, stiff, medium plasticity	
	1						SM	7.5YR4/4, brown, very fine, SILTY SAND, with fine to medium gravel, lenses of black/gray cinders 1.3 ft bgs; Black and gray cinders	Sample 54SB33A sample collected at 1-2 ft bgs.
1695	2		1	3.5	ND			2.2 ft bgs; Black and gray cinders	
	3						CINDERS	3.0-4.0 ft bgs; Black and gray cinders	
	4								
	5							5.0 ft bgs; Black and gray cinders	
	6		2	3.5	ND				
1690	7						SM	6.7 ft bgs; Black and gray cinders 7.0-7.1 ft bgs; Black and gray cinders with organics, moist	
	8								
	9		3	2.0	ND				Samples 54SB33B and MS/MSD collected at 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1685	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB33

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB34

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1698.03**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR3/4, dark brown, SILTY fine SAND, moist, loose, homogeneous	Sample 54SB34A collected from 0-1 ft bgs.
	1								
	2		1	3.6	ND				
1695	3								
	4								
	5						SM	Grading to 7.5YR4/6, strong brown, less silt	
	6		2	3.8	ND				
	7							7.0 ft bgs; very moist to wet	
1690	8								
	9		3	2.0	ND				Sample 54SB34B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB34

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB35

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.63**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						CL	7.5YR5/8, strong brown, SANDY CLAY, moist, hard	
	1						GM	Fine, angular gravel, with silt, dry	Sample 54SB35A collected at 1.2 ft bgs.
1695								7.5YR5/8, strong brown, SILTY SAND, moist, dense, micaceous, homogeneous, non-cohesive	
	2		1	3.6	ND				
	3								
	4								
	5							Grading to less silt	
	6		2	4.0	ND		SM		
1690									
	7							7.0-10.0 ft bgs; 7.5YR4/6, strong brown, SILTY fine SAND, moist, loose, micaceous	
	8								
	9		3	2.0	ND				Sample 54SB35B collected at 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1685									
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB35

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB36

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.31**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR4/6, strong brown, SILTY SAND, trace pea gravel, moist, non-cohesive, micaceous, homogeneous	Sample 54SB36A collected at 0-1 ft bgs.
	1								
1695									
	2		1	3.3	ND				
	3								
	4						SM	Grading to 7.5YR 5/8, strong brown, fine SAND, less silt	
	5								
	6		2	3.5	ND				
1690									
	7								
	8							7.5YR 5/8, strong brown, fine SAND, moist, micaceous, homogeneous	
	9		3	2.0	ND		SP		Samples 54SB36B and Duplicate collected at 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1685									
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB36

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB37

Sheet 1 of 1

Date(s) Drilled	**12/03/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.09**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						CL	7.5YR5/8 4/6, strong brown, SANDY CLAY, stiff, micaceous, plastic 0.5-1.0 ft bgs; 7.5YR3/4, dark brown, CLAY , with angular pea gravel	
1695	1							7.5YR4/6, SILTY fine SAND, moist, micaceous, homogeneous, hard	Sample 54SB37A collected at 1-1.5 ft bgs.
	2		1	4.0	ND				
	3								
	4						SM		
	5								
1690	6		2	3.6	ND				
	7							10YR5/4, yellow brown, fine SAND, with silt lenses, moist	
	8						SP		
	9		3	2.0	ND				Sample 54SB37B collected at 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
1685	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB37

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Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB38

Sheet 1 of 1

Date(s) Drilled	**12/04/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.31**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA A**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR3/4, dark brown, very fine, SANDY SILT, moist, soft, loose, non-cohesive, micaceous	Sample 54SB38A collected at 0-1 ft bgs.
	1								
1695									
	2		1	3.3	ND				
	3								
	4						ML	4.0-9.0 ft bgs; 7.5YR4/4, brown, fine SANDY SILT, moist, loose, soft, micaceous, homogeneous	
	5								
								Increasing sand with depth	
	6		2	4.0	ND				
1690									
	7								
	8								
	9		3	2.0	ND		SM	7.5YR 4/4, brown, SILTY fine SAND, moist	Sample 54SB38B collected at 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1685									
	12								

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB39

Sheet 1 of 1

Date(s) Drilled	**12/10/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1700.91**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1700	0							7.5YR 4/4, brown, SANDY SILT, soft, moist	Sample 54SB39A collected from 0-1 ft bgs.
	1						ML		
	2		1	3.0	ND			7.5YR 4/6, strong brown, SILTY very fine SAND, moist, micaceous	
	3								
	4								
	5						SP	4.5-10.0 ft bgs; 7.5YR 5/6, strong brown, fine, SAND, poorly graded, dry, very loose, micaceous, dry	
1695	6		2	4.0	ND				
	7								
	8								
	9		3	2.0	ND				Sample 54SB39B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
1690	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB39

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB40

Sheet 1 of 1

Date(s) Drilled	**12/10/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1697.44**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 5/6, strong brown, SILTY fine SAND, moist, soft, micaceous	Sample 54SB40A collected from 0-1 ft bgs.
	1						SM		
	2		1	3.0	ND				
1695									
	3							7.5YR 3/3, dark brown, very fine SANDY SILT, moist, stiff, friable	
	4						ML		
	5							5.0 ft bgs; Trace clay, medium, stiff	
	6		2	4.0	ND			7.5YR 4/6, strong brown, SILTY fine SAND, moist, micaceous, mottled trace clay, 5YR 5/6, yellow red, medium dense	
	7								
1690									
	8						SM	8.0 ft bgs; Trace clay grading out	
	9		3	2.0	ND				Sample 54SB40B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB40

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB41

Sheet 1 of 1

Date(s) Drilled	**12/10/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1704.70**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/4, dark brown, SILTY fine SAND, poorly graded,moist, medium dense, micaceous,	Samples 54SB41A and MS/MSD collected from 0-1 ft bgs.
	1								
	2		1	3.3	ND		SM		
	3							3.0 ft bgs; Gravel and coarse sand	
	4								
1700	5						ML	7.5YR 3/4, dark brown, very fine SANDY SILT, moist, trace gravel, micaceous	
	6		2	3.8	ND				
	7								
	8							Grading to 7.5YR 4/6, strong brown	
	9		3	2.0	ND		SP	7.5YR 4/6, strong brown, fine SAND, poorly graded, moist, micaceous, loose	Sample 54SB41B collected from 9-10 ft bgs.
1695	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB41

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB42

Sheet 1 of 1

Date(s) Drilled	**12/10/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1700.79**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1700	0						CL	7.5YR 4/6, strong brown, fine SANDY CLAY, moist, slightly plastic	Samples 54SB42A and Duplicate collected from 0-1 ft bgs.
	1							7.5YR 3/3, dark brown, SILTY fine SAND, moist, homogeneous, 2 pieces of hard black material	
	2		1	2.5	ND				
	3								
	4							4.0 ft bgs; Small fibrous like material and some black flaky material	
	5						SM		
1695	6		2	4.0	ND				
	7								
	8							8.5-10.0 ft bgs; 7.5YR 5/6, strong brown, SILTY fine SAND, moist, micaceous	
	9		3	2.0	ND				Sample 54SB42B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
1690	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB42

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB43

Sheet 1 of 1

Date(s) Drilled	**12/04/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**15.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696.54**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/4, dark brown, SILTY fine SAND, moist, loose	
1695							SM	1.0 ft bgs; Becoming more sandy, MnO	Sample 54SB43A collected from 0.5-1 ft bgs.
	2		1	4.0	ND			7.5YR 3/4, dark brown, very fine SANDY SILT, moist, stiff, micaceous, homogenous	
	4						ML		
	6		2	4.0	ND				
1690								7.5YR 5/4, brown, SILTY fine SAND, moist, micaceous	
	8						SM	Increasing sand	Sample 54SB43B collected from 8-9 ft bgs.
	10		3	4.0	ND			7.5YR 5/6, strong brown, fine SAND, moist to wet, micaceous	Sample 54SB43C collected from 10-11 ft bgs.
1685							SP		
	12								
			4	3.0	ND			Fine to coarse SAND/GRAVEL/SILT	
	14						GM	14.2 ft bgs; 10YR 6/4, light yellow brown, weathered ROCK, SILTSTONE, friable	
								Borehole Refusal at 15.0 ft bgs	
	16								
1680									

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB43

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB44

Sheet 1 of 1

Date(s) Drilled	**12/04/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**20.7 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1704.00**
Groundwater Level(s)	**18.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR3/2, dark brown, very fine SANDY SILT, moist, soft, homogeneous	Sample 54SB44A collected from 0.5-1 ft bgs.
			1	4.0	ND				
1700								4.0-6.5 ft bgs; 7.5YR5/6, strong brown, very stiff, very fine SANDY SILT, moist, micaceous	
	5						ML		
			2	4.0	ND			6.5-7.0 ft bgs; 7.5YR4/4, brown, very fine SANDY SILT, moist, medium gravel, micaceous, homogeneous	
1695							GM	7.5YR5/6, strong brown, GRAVEL, SAND, and SILT	Sample 54SB44B collected from 9-10 ft bgs.
	10		3	4.0	ND			7.5YR5/6, strong brown, SILTY fine SAND, moist, stiff, micaceous	
								11.2-11.3 ft bgs; thin gravel layer	
			4	4.0	ND			13.0 ft bgs; Trace gravel	
1690									
	15						SM		
								16.0 ft bgs; Trace gravel	
			5	4.0	ND				Samples 54SB44C and Duplicate collected from 17-18 ft bgs.
								▽ 18.0 ft bgs; Fine sand grading to medium sand	
1685									
	20		6	1.7	ND			19.0-20.7 ft bgs; 7.5YR5/8, strong brown, very soft, SILTY, medium SAND, with weathered gravel, wet	
								Borehole Refusal at 20.7 ft bgs	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB44

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB45

Sheet 1 of 1

Date(s) Drilled	**12/02/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1700.94**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						ML	7.5YR 4/3, brown, fine SANDY SILT, moist, soft	Sample 54SB45A collected from 0-1 ft bgs.
1700	1							7.5YR 5/6, strong brown, SILTY fine SAND, moist, dense, homogeneous, micaceous	
	2		1	3.7	ND				
	3								
	4						SM	Grading to less silt	
	5								
1695	6		2	4.0	ND				
	7							7.0-10.0 ft bgs; 7.5YR 5/6, strong brown, fine SAND, trace silt, moist	
	8								
	9		3	2.0	ND				Sample 54SB45B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
1690	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB45

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB46

Sheet 1 of 1

Date(s) Drilled	**12/04/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**16.2 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1698.14**
Groundwater Level(s)	**12.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR3/2, dark brown, FILL, GRAVEL, SILT, SAND, moist, black stained, burn material	
	2		1	3.0	ND				Sample 54SB46A collected from 0.5-1 ft bgs.
1695									
	4						GM		
	6		2	2.0	ND				
								Grading to 7.5YR2.5/1, black	
1690	8								Sample 54SB46B collected from 7.5-9 ft bgs.
	10		3	3.2	ND			7.5YR5/6, strong brown, very fine to fine SAND, moist, homogeneous, micaceous	
									Sample 54SB46C collected from 11-12 ft bgs.
	12							▽	
1685							SP		
	14		4	2.0	ND				
	16		5	0.2	ND		GM	Fine to coarse GRAVEL, wet	
								Borehole Refusal at 16.2 ft bgs	
	18								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB46

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB47

Sheet 1 of 1

Date(s) Drilled	**12/09/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1694.02**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/3, dark brown, fine, SANDY SILT, moist, trace sand, soft, micaceous, cohesive	Samples 54SB47A and Duplicate collected from 0-1 ft bgs.
	1							Grading to more sand	
	2		1	3.7	ND		ML	2.0-3.5 ft bgs; 7.5YR 4/6, strong brown, fine SANDY SILT, moist, elastic, stiff, micaceous	
	3								
1690	4							7.5YR 4/6, strong brown, SILTY fine SAND, dense, cohesive, micaceous	
	5							Grading to less silt	
	6		2	4.0	ND		SM		
	7								
	8							8.0-10.0 ft bgs; 7.5YR 4/6, strong brown, fine SAND, trace silt, moist, micaceous	
1685	9		3	2.0	ND				Sample 54SB47B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB47

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB48

Sheet 1 of 1

Date(s) Drilled	**12/09/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1701.60**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						ML	7.5YR 4/6, strong brown, SANDY SILT, moist, micaceous	Sample 54SB48A collected from 0-1 ft bgs.
								7.5YR 3/3, dark brown, SILTY fine SAND, with MnO, moist	
	1								
1700								1.5 ft bgs; Grading to 7.5YR 4/6, strong brown, loose, micaceous	
	2		1	3.2	ND				
	3								
	4								
	5						SM		
	6		2	4.0	ND				
1695									
	7								
	8								
	9		3	2.0	ND				Sample 54SB48B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1690									
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB48

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB49

Sheet 1 of 1

Date(s) Drilled	**12/04/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**16.2 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1697.67**
Groundwater Level(s)	**15.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						ML	7.5YR3/4, dark brown, very fine, SANDY SILT, moist, loose, micaceous	
							GM	7.5 YR 2.5/1, Black, GRAVEL, SAND, and SILT, moist, some MnO	Samples 54SB49A and MS/MSD collected from 1-2 ft bgs.
	2		1	3.5	ND			7.5YR3/4, dark brown, SILTY fine SAND, moist, loose, homogeneous	
1695									
	4								
	6		2	3.7	ND			6.0-14.5 ft bgs; 7.5YR5/6, strong brown, fine SAND, trace silt, moist, loose, micaceous	
1690							SM		
	8								
	10		3	4.0	ND				Sample 54SB49B collected from 9-10 ft bgs.
	12								
1685									
	14		4	4.0	ND				Sample 54SB49C collected from 13.5-14.5 ft bgs.
							GM	GRAVEL, SILT, and SAND, wet, loose ▽	
	16		5	0.2	ND		SM	Fine to coarse SAND, trace silt, wet	
								Borehole Refusal at 16.2 ft bgs	
1680	18								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB49

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB50

Sheet 1 of 1

Date(s) Drilled	**12/09/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1694.08**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						7.5YR 4/3, brown, SILTY CLAY, highly plastic, medium stiff	Sample 54SB50A collected from 0-1 ft bgs.
	1					CL	Grading to less clay	
	2		1	3.2	ND			
	3						7.5YR 4/6, strong brown, fine SANDY SILT, moist, trace clay, micaceous, medium dense, slightly cohesive	
1690	4					ML		
	5							
	6		2	4.0	ND		7.5YR 5/4, brown, fine SAND, trace silt, medium dense, micaceous, moist	
	7							
	8					SP		
1685	9		3	2.0	ND			Sample 54SB50B collected from 9.5-10 ft bgs.
	10						Borehole Terminated at 10.0 ft bgs	
	11							
	12							

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB50

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB51

Sheet 1 of 1

Date(s) Drilled	**12/04/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**21.5 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1702.91**
Groundwater Level(s)	**17.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/3, dark brown, fine SANDY SILT, moist, homogeneous, soft- medium stiff, micaceous	Sample 54SB51A collected from 0-1 ft bgs.
			1	4.0	ND				
1700							ML	Grading to 7.5YR 4/4, brown	
	5							Grading to increasing sand	
			2	4.0	ND				
1695							SM	7.5YR 4/6, strong brown, SILTY SAND, moist, medium dense, homogeneous, micaceous	
							GM	SILT, SAND, GRAVEL, moist, micaceous	
	10		3	3.5	ND			7.5YR 4/6, strong brown, fine SAND, moist	
1690			4	3.5	ND				
	15						SP	15.5 ft bgs; Trace rock chips	
1685			5	4.0	ND				
	20							19.0-20.9 ft bgs; 10YR 5/4, yellowish brown, fine to medium SAND, trace silt, wet	
			6	1.5	ND				
							GM	GRAVEL, SAND, SILT, wet	
1680								Borhole Refusal at 21.5 ft bgs	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB51

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB52

Sheet 1 of 1

Date(s) Drilled	**12/10/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1711.06**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 5/6, strong brown, fine SANDY CLAY, homogenous, slight plasticity, moist	Sample 54SB52A collected from 0-1 ft bgs.
1710	1								
	2		1	4.0	ND		CL		
	3							Increasing sand, soft to medium stiff	
	4								
	5							7.5YR 5/6, strong brown, CLAYEY SAND, moist, loose to medium dense, cohesive, trace fine to medium gravels, rounded	
1705	6		2	3.8	ND				
	7						SC	Increasing gravel	
	8								
	9		3	2.0	ND		GC	7.5YR 4/6, strong brown, SAND, CLAY, GRAVEL, moist	Sample 54SB52B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
1700	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB52

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB53

Sheet 1 of 1

Date(s) Drilled	**12/10/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1695.28**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1695	0						ML	7.5YR 3/4, dark brown, fine, SANDY SILT, moist, soft Increasing sand	Sample 54SB53A collected from 0-1 ft bgs.
	1								
	2		1	3.0	ND		CH	7.5YR 4/4, brown, CLAY, very stiff, high plasticity Increasing silt	
	3						CL	7.5YR 3/4, dark brown, SILTY CLAY, moist, slight plasticity, stiff, homogeneous	
	4							4.0-6.0 ft bgs; 7.5YR 4/3, brown, fine SANDY CLAY, moist, slight plasticity	
1690	5								
	6		2	4.0	ND		SM	7.5YR 4/6, strong brown, SILTY fine SAND, moist, dense	
	7								
	8							Decreasing silt	
	9		3	2.0	ND			7.5YR 4/6, strong brown, fine SAND, mosit, trace silt	Sample 54SB53B collected from 9-10 ft bgs.
1685	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB53

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB54

Sheet 1 of 1

Date(s) Drilled	**12/09/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1701.88**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						ML	7.5YR 3/4, dark brown, very fine SANDY SILT, moist, soft	Sample 54SB54A collected from 0-1 ft bgs.
	1								
1700	2		1	3.6	ND		SM	7.5YR 4/4, brown, SILTY fine SAND, dense, moist, micaceous	
	3								
	4							Decreasing silt	
	5								
	6		2	4.0	ND			6.0-8.0 ft bgs; 7.5YR 5/6, strong brown, SILTY fine SAND, moist, micaceous	
1695	7								
	8						SP	7.5YR 4/5, strong brown, SAND, moist, trace silt, poorly graded	
	9		3	2.0	ND				Sample 54SB54B collected from 9-10 ft bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
1690	12								

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54SB55

Sheet 1 of 1

Date(s) Drilled	**12/09/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**10.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1697.57**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments	**SWMU 54 AREA B**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						SM	7.5YR 4/4, brown, SILTY fine SAND, most, micaceous, soft	Sample 54SB55A collected from 0.5-1 feet bgs.
								7.5YR 3/1, very dark gray, SAND, cinders, moist, poorly graded, loose	
	1						SP		
	2		1	3.0	ND			7.5YR 4/6, strong brown, SILTY fine SAND, moist, loose	
1695									
	3						SM		
	4							7.5YR 4/6, strong brown, fine SAND, moist, trace silt, poorly graded, loose, micaceous	
	5								
	6		2	4.0	ND				
	7						SP		
1690									
	8								
	9		3	2.0	ND				Samples 54SB55B and Duplicate collected from 9-10 feet bgs.
	10							Borehole Terminated at 10.0 ft bgs	
	11								
	12								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54SB55

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54DPW1

Sheet 1 of 1

Date(s) Drilled	**12/11/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**14.7 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1691 msl**
Groundwater Level(s)	**13.4 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/4, dark brown, SILTY very fine, SAND, moist, loose, micaceous, homogenous	
1690									
	2		1	3.0	ND				
	4							5.0-13.0 ft bgs; 7.5YR 5/6, strong brown, fine SAND, moist, trace silt, medium dense, micaceous	
1685	6		2	3.0	ND			Occasional lenses	
	8						SM		
	10		3	4.0	ND				
1680									
	12								
	14		4	4.0	ND			13.0-14.7 ft bgs; 7.5YR 4/4, brown, SILTY fine SAND, moist, soft, loose, micaceous ▽	
								Borehole Refusal at 14.7 ft bgs	
1675	16								
	18								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54DPW1

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54DPW2

Sheet 1 of 1

Date(s) Drilled	**12/02/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**21.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1695 msl**
Groundwater Level(s)	**17.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/3, dark brown, SILTY fine SAND, moist, homogeneous, micaceous	
			1	2.9	ND		SM		
								7.5YR 4/4, brown, fine SAND, moist, trace silt, very loose, homogeneous, micaceous	
1690	5							Grading to 7.5YR 4/6, strong brown	
			2	3.5	ND		SP		
1685	10		3	3.5	ND				
								7.5YR 4/3, brown, SILTY fine SAND, moist, medium dense, micaceous	
			4	3.0	ND		SM		
1680	15						SW	7.5YR 5/6, strong brown, fine to medium, SAND, moist, well graded, speckled (black, strong brown, reddish yellow), very loose	
								7.5YR 4/3, brown, very fine, poorly graded, SAND, micaceous, loose, wet ▽	
			5	3.0	ND		SP	18.3-19.5 ft bgs; 10YR 4/2, dark grayish brown, fine to medium, SAND, moist, poorly graded, trace silt	
1675	20				ND			7.5YR 5/8, strong brown, fine to coarse, gravel, fine to coarse SAND and SILT	
			6	1.0			GM		
								Borehole Refusal at 21.0 ft bgs	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 9/30/2005 54DPW2

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54DPW3

Sheet 1 of 1

Date(s) Drilled	**12/10/2002**	Logged By	**J. Spangler**	Reviewed By	**T. LaMaskin**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**17.5 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1689 msl**
Groundwater Level(s)	**13.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8 inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						SM	7.5YR 3/4, brown, SILTY fine SAND, moist, very soft, loose	
							SP	7.5YR 5/6, strong brown, medium SAND, layer, moist	
	2		1	2.3	ND		SM	7.5YR 4/4, brown, SILTY fine SAND, moist, soft	
1685	4							4.0-6.0 ft bgs; 2.5YR 4/6, red, SILTY fine SAND, moist, soft	
								Interbedded sands	
	6		2	3.8	ND		ML	5YR 4/6, yellowish red, SILT, dry, very hard, friable	
								Increasing sand	
	8						SM	7.5YR 4/6, strong brown, SILTY fine SAND, moist, micaceous	
1680	10		3	1.5	ND			11.3-11.5 ft bgs; 7.5YR 4/6, CLAY, moist, highly plastic	
	12							7.5YR 4/6, strong brown, SILTY fine SAND, moist, micaceous	
							SP	7.5YR 5/3, brown, fine, SAND, speckled with black, yellow, highly micaceous	
1675	14		4	3.8	ND			14.0 ft bgs; 7.5YR 4/1, dark gray, wet	
	16						GM	Fine to coarse SILT, GRAVEL, SAND, wet, rounded to angular	
			5	1.5	ND				
	18							Borehole Refusal at 17.5 ft bgs	

URS

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB56

Sheet 1 of 1

Date(s) Drilled	**8/18/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**17.8 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1685 msl**
Groundwater Level(s)	**13.9 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1685	0							5YR 4/4 reddish brown, silty very fine SAND, slightly moist, loose, homogeneous, micaceous	Collected 54SB56A at 0.0-1.0 ft bgs
	2		1	3.2	ND		ML	Silt grades less	
	4							5YR 4/3 reddish brown, silty fine SAND with trace clay, moist, medium dense to loose	
1680									
	6		2	3.8	ND			6.5-7.2 ft bgs; 5YR 4/3 reddish brown, fine SAND layer, dry to slightly moist	
								5YR 4/3 reddish brown, silty fine SAND with trace clay	
	8						SM		
									Collected 54SB56B at 9.0-10.0 ft bgs
1675	10		3	3.6	ND			9.5-11.0 ft bgs; 7.5YR 4/6 strong brown, silty SAND, slightly moist, loose	
								11.0-13.9 ft bgs; silty fine to medium SAND, homogeneous	
	12								Collected 54SB56C at 12.5-13.8 ft bgs
	14		4	3.0	ND			7.5YR 4/6 strong brown, gravelly fine to medium SAND, wet, loose	
1670							SP	Gravel; fine and rounded	
	16							5YR 5/8 yellowish red, GRAVEL and SAND, wet; gravel, fine to medium, sub-rounded; sand, fine to coarse, rounded	
			5	1.8	ND		GP	17.0-17.8 ft bgs; 5YR 4/6 yellowish red, medium to coarse GRAVEL with some medium to coarse sand, wet, angular	
	18							5YR 4/2 dark reddish gray SILT/Rock flour	
								Borehole Refusal 17.8 ft bgs	
	20								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB56

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB57

Sheet 1 of 1

Date(s) Drilled	**8/17/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**23.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1697 msl**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							5YR 4/6 yellowish red, very fine sandy SILT with trace gravel, dry to slightly moist, medium stiff, micaceous; gravel, rounded	Collected 54SB57A at 0.0-1.0 ft bgs
1695			1	3.2	ND			2.2-4.7 ft bgs; 10YR 3/3 dark brown, very fine sandy SILT with some clay and trace fine gravel, moist; gravel, sub-rounded	
	5		2	4.0	ND			4.7-10.0 ft bgs; 7.5YR 4/4 brown, SILT with very fine sand, highly micaceous, homogeneous Moisture increases	
1690								8.0 ft bgs; Sand increases and becomes very moist	Collected 54SB57B and MS/MSD at 8.0-12.0 ft bgs
	10		3	3.2	ND		ML	10.0-14.2 ft bgs; 7.5YR 4/6 strong brown, very fine SAND and SILT, very moist, highly micaceous, loose to medium dense, homogeneous	
1685			4	3.2	ND			14.2-14.6 ft bgs; SAND layer, dry 10YR 4/4 dark yellowish brown, SILT and fine SAND, moist; silt, elastic	
	15							15.0-15.4 ft bgs; perched water	Collected 54SB57C and Dup-1 at 16.0-18.0 ft bgs
1680			5	4.0	ND				
							GM	fine to medium GRAVEL with fine to medium sand and some silt, very moist to wet	
	20						SM	10YR 4/4 dark yellowish brown, silty SAND	
1675			6	3.0	ND		GP	fine GRAVEL with fine to coarse sand, wet	
							Saprolite	10YR 4/2 dark grayish brown, clayey silt SAPROLITE with some rock flour and angular gravel, hard	
	25							Borehole Refusal 23.0 ft bgs	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB57

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB58

Sheet 1 of 1

Date(s) Drilled	**8/17/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**26.6 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1700 msl**
Groundwater Level(s)	**24.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1700	0							7.5YR 4/4 brown, silty fine SAND, dry to slightly moist, loose, micaceous	Collected 54SB58A at 0.0-1.0 ft bgs
			1	2.6	ND			0.9 ft bgs; color grades to 7.5YR 3/4 dark brown 1.5-4.0 ft bgs; 7.5YR 4/6 strong brown, fine SAND with some silt, slightly moist, loose	
	5							4.0-9.0 ft bgs; becomes moist and micaceous	
1695			2	3.4	ND				
							SM	Increasing moisture	
	10		3	3.7	ND			9.0-10.5 ft bgs; SAND and SILT, elastic	Collected 54SB58B at 9.0-10.0 ft bgs
1690								10.5-16.0 ft bgs; 7.5YR 4/6 strong brown, silty fine SAND, moist	
								11.5-12.0 ft bgs; perched water zone	
			4	3.4	ND				
	15								
1685								10YR 4/3 brown, sandy SILT, moist, soft, micaceous	Collected 54SB58C at 16.0-18.0 ft bgs
			5	3.4	ND		ML	18.0-18.2 ft bgs; SAND layer 18.5-18.8 ft bgs; SAND layer	
	20							19.4-19.6 ft bgs; SAND layer	
1680									
			6	3.5	ND			21.5-22.0 ft bgs; 7.5YR 4/6 strong brown, fine SAND with silt, moist GRAVEL and SAND with some silt; gravel, fine to medium; sand, fine to coarse	
							GM	▽	
	25		7	2.6	ND				
1675							Saprolite	7.5YR 5/1 gray, SAPROLITE, silt/rock flour, very moist	
								Borehole Refusal 26.6 ft bgs	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB58

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB59

Sheet 1 of 1

Date(s) Drilled	**8/18/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**20.6 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1689 msl**
Groundwater Level(s)	**14.7 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/3 dark brown, SILT and very fine SAND, slightly moist, loose, homogeneous, micaceous	Collected 54SB59A at 0.0-1.0 ft bgs
			1	3.2	ND		ML	Silt grades less	
1685								7.5YR 4/6 strong brown, fine to medium SAND	
	5						SP	3.2-4.8 ft bgs; 7.5YR 6/6 reddish yellow	
								4.8-5.2 ft bgs; 10YR 3/4 dark yellowish brown, silty fine SAND layer, moist	
			2	2.7	ND			7.5YR 5/6 strong brown, fine to medium SAND with some silt, moist, loose, micaceous	
1680									Collected 54SB59B at 9.0-10.0 ft bgs
	10		3	3.2	ND		SM		
								11.1-12.5 ft bgs; 7.5YR 4/6 strong brown, silty fine SAND, very moist, medium dense, micaceous	
								12.5-13.7 ft bgs; 10YR 4/4 dark yellowish brown, silty fine SAND, moist, loose	Collected 54SB59C and Dup-2 at 13.0-15.0 ft bgs
1675			4	4.0	ND			13.7-15.4 ft bgs; 10YR 3/6 dark yellowish brown, silty SAND with little clay, very moist, micaceous	
	15							▽ 14.7 ft bgs; wet	
								15.4-16.0 ft bgs; 10YR 4/6 dark yellowish brown, GRAVEL and SAND with some silt; gravel fine to medium, rounded; sand, fine to coarse	
								7.5YR 5/6 strong brown, medium SAND	
			5	2.7	ND		SP	17.3-17.5 ft bgs; GRAVEL layer, sub-rounded to sub-angular	
1670								18.3-18.6 ft bgs; GRAVEL layer, sub-rounded to sub-angular	
	20		6	0.0					
								Borehole Refusal 20.6 ft bgs	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB59

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB60

Sheet 1 of 1

Date(s) Drilled	**8/18/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**19.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1694 msl**
Groundwater Level(s)	**13.5 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/3 dark reddish brown, silty very fine SAND, slightly moist, loose, homogeneous, micaceous	Collected 54SB60A at 0.0-1.0 ft bgs
			1	3.0	ND		ML		
1690								7.5YR 4/6 strong brown, silty fine SAND with trace clay, slightly moist, medium dense, micaceous	
	5							4.5-5.5 ft bgs; becomes 7.5YR 3/4 dark brown with some clay	
			2	2.9	ND			5.5-5.7 ft bgs; 5YR 4/4 reddish brown, fine to medium SAND layer, loose 5.7-11.5 ft bgs; 5YR 4/4 reddish brown, silty fine SAND	
								6.7-7.0 ft bgs; fine to medium SAND layer	
							SM		
1685								8.5-9.0 ft bgs; fine to medium SAND layer	
								9.0-10.5 ft bgs; silty fine SAND with trace clay	Collected 54SB60B at 9.0-10.0 ft bgs
	10		3	3.7	ND			10.5-10.8 ft bgs; fine to medium SAND layer	
								11.5-11.8 ft bgs; 5YR 4/4 reddish brown, CLAY layer, slightly moist, plastic, soft, micaceous	
								11.8-13.5 ft bgs; silty SAND, slightly moist, loose, micaceous	Collected 54SB60C at 12.0-13.5 ft bgs
								▽	
1680			4	3.6	ND		CL	7.5YR 5/3 brown, sandy CLAY with gravel, loose to medium dense	
	15							7.5YR 5/6 strong brown, SAND and GRAVEL; sand, fine to coarse; gravel, fine to medium, sub-angular to angular	
							GP		
			5	3.0	ND			17.0-18.0 ft bgs; gravel is coarse	
							Saprolite	Gley 1 5/5G greenish gray, gravel and clay SAPROLITE, moist	
1675								Borehole Refusal 19.0 ft bgs	
	20								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB60

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB61

Sheet 1 of 1

Date(s) Drilled	**8/17/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**25.6 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1702 msl**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/3 dark brown, silty fine SAND, slightly moist, loose, micaceous, homogeneous	Collected 54SB61A at 0.0-1.0 ft bgs
1700			1	3.2	ND				
								4.0-9.8 ft bgs; 10YR 4/4 dark yellowish brown, SAND with some silt	
	5		2	3.4	ND		SM		
1695									
									Collected 54SB61B at 9.0-10.0 ft bgs
	10		3	3.5	ND			9.8-11.5 ft bgs; 7.5YR 4/4 brown, silty fine SAND, very moist, soft, micaceous	
								11.5-12.0 ft bgs; clayey silty SAND, wet, perched water zone	
1690								7.5YR 4/6 strong brown, silty very fine SAND with trace clay, very moist, very soft, moderately cohesive, micaceous	
			4	3.6	ND				
	15						ML		Collected 54SB61C at 16.0-18.0 ft bgs
1685			5	4.0	ND				
							SM	Increasing SAND	
	20							7.5YR 4/6 strong brown, silty SAND with trace clay	
								Clay grades out	
1680			6	4.0	ND		SM	21.2-23.2 ft bgs; 10YR 4/4 dark yellowish brown, silty fine SAND, wet, micaceous	
								GRAVEL/SAND/SILT, wet; sand, fine to coarse; gravel, fine	
	25		7	1.6	ND		GM		
							Saprolite	Gley 2 6/1, greenish gray, SAPROLITE, hard	
								Borehole Refusal 25.6 ft bgs	
1675									

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB61

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB62

Sheet 1 of 1

Date(s) Drilled	**8/19/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**18.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1701 msl**
Groundwater Level(s)	**17.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1700	0							5YR 3/3 dark reddish brown, silty SAND, moist, medium dense, homogeneous, micaceous	Collected 54SB62A at 0.0-1.0 ft bgs
	2		1	3.2	ND			2.6-5.5 ft bgs; 7.5YR 5/4 brown, medium SAND with some silt, moist, loose	
	4								
1695	6		2	3.4	ND			5.5-17.0 ft bgs; 7.5YR 4/4 brown, silty SAND, moist, medium dense	
	8						SM		
	10		3	3.5	ND				Collected 54SB62B and Dup-6 at 9.0-10.0 ft bgs
1690								11.0-11.2 ft bgs; SAND layer	
	12							12.8-13.0 ft bgs; SAND layer	
	14		4	3.0	ND			14.4-14.6 ft bgs; SAND layer	
1685	16								Collected 54SB62C at 15.0-16.0 ft bgs
			5	2.0	ND			16.5-16.7 ft bgs; SAND layer 17.0-18.0 ft bgs; 10YR 4/2 dark grayish brown, silty SAND, wet	▽
	18							Borehole Refusal 18.0 ft bgs	
	20								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB62

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB63

Sheet 1 of 1

Date(s) Drilled	**8/19/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**13.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1692 msl**
Groundwater Level(s)	**12.2 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							5YR 3/3 dark reddish brown, very fine sandy SILT, slightly moist	Collected 54SB63A and Dup-4 at 0.0-1.0 ft bgs
	1						ML	0.5-0.7 ft bgs; 5YR 4/6 yellowish red, fine SAND layer, loose 0.7-2.2 ft bgs; 5YR 4/4 reddish brown, very fine sandy SILT with some clay, micaceous	
1690	2		1	2.9	ND				
	3							5YR 4/6 yellowish red, silty SAND, slightly moist, loose	
	4								
	5							4.8-5.0 ft bgs; 7.5YR 4/4 brown, fine SAND layer, loose 5.0-10.0 ft bgs; 7.5YR 4/4 brown, silty fine SAND, slightly moist, dense, micaceous	
	6		2	2.7	ND		SM		
1685	7							Grades less silt to 8.0 ft bgs	
	8								
	9								Collected 54SB63B and MS/MSD at 9.0-10.0 ft bgs
	10		3	3.0	ND			10.0-12.2 ft bgs; 7.5YR 3/4 dark brown, silty SAND with trace clay, slightly moist, medium dense, micaceous	
	11								Collected 54SB63C at 11.0-12.0 ft bgs
1680	12		4	1.0	ND			12.2-13.0 ft bgs; 7.5YR 5/2 brown, silty fine to medium SAND, wet, micaceous	
	13							Borehole Refusal 13.0 ft bgs	
	14								
	15								

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB64

Sheet 1 of 1

Date(s) Drilled	**8/18/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**16.5 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1694 msl**
Groundwater Level(s)	**13.6 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 4/4 brown, silty very fine SAND, dry to slightly moist, loose, micaceous, homogeneous	Collected 54SB64A at 0.0-2.0 ft bgs
	2		1	2.2	ND		SM		
1690	4							4.3-4.7 ft bgs; fine SAND layer, dry	
								5YR 4/3 dark reddish brown, clayey SILT with some very fine sand, slightly moist, dense, friable	
	6		2	3.2	ND		ML	6.1-6.4 ft bgs; fine SAND layer, dry	
	8						SM	5YR 3/4 dark reddish brown, silty fine SAND, dry to slightly moist	
1685								5YR 4/6 yellowish red, clayey SILT, slightly moist	Collected 54SB64B at 9.0-10.0 ft bgs
	10		3	3.1	ND		ML	9.6-10.1 ft bgs; 7.5YR 4/6 strong brown, fine SAND layer	
	12						SM	11.3-13.6 ft bgs; silty SAND with banded saprolitic texture, moist	Collected 54SB64C at 12.5-13.5 ft bgs
	14		4	4.0	ND			13.6-14.2 ft bgs; silty medium SAND, wet	
1680							GP	7.5YR 5/4 brown, GRAVEL and SAND; gravel, medium to coarse; sand, medium to coarse	
	16		5	0.0	ND				
								Borehole Refusal 16.5 ft bgs	
	18								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB64

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB65

Sheet 1 of 1

Date(s) Drilled	**8/19/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**18.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1698 msl**
Groundwater Level(s)	**NA**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 3/3 dark brown, silty fine SAND, slightly moist, loose, micaceous	Collected 54SB65A at 0.0-1.0 ft bgs
								1.0-6.5 ft bgs; 7.5YR 5/4 brown, silty medium SAND, moist, homogeneous	
	2		1	2.7	ND				
1695									
	4								
								Grades clayey at 6.5 ft bgs	
	6		2	3.6	ND				
								6.5-17.5 ft bgs; silty medium SAND with trace to some clay	
1690	8						SM		
									Collected 54SB65B at 9.0-10.0 ft bgs
	10		3	3.5	ND				
	12								
1685									
	14		4	4.0	ND				
									Collected 54SB65C at 15.0-17.0 ft bgs
	16								
			5	2.0	ND			17.5-17.8 ft bgs; coarse sandy CLAY, plastic	
								17.8-18.0 ft bgs; medium to coarse SAND, very moist	
1680	18							Borehole Refusal 18.0 ft bgs	
	20								

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB66

Sheet 1 of 1

Date(s) Drilled	**8/19/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**15.6 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1692 msl**
Groundwater Level(s)	**12.5 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						ML	7.5YR 3/4 dark brown, very fine sandy SILT with some clay, slightly moist, medium stiff, micaceous	Collected 54SB66A at 0.0-1.0 ft bgs
								0.7-2.7 ft bgs; 5YR 4/4 reddish brown, silty very fine SAND, medium dense, micaceous, homogeneous	
1690	2		1	3.1	ND				
							CL	5YR 4/4 reddish brown, silty CLAY, slightly moist, slightly plastic, stiff	
	4								
							SM	5YR 4/6 yellowish red, silty fine SAND with some clay, slightly moist, loose, micaceous	
	6		2	2.6	ND				
1685									
	8							8.5-9.0 ft bgs; 5YR 4/6 yellowish red, medium SAND	
							CL	5YR 4/4 reddish brown, very fine sandy CLAY, slightly moist, slightly plastic, medium dense	Collected 54SB66B at 9.0-10.0 ft bgs
	10		3	4.0	ND			10.6-12.0 ft bgs; very moist	Collected 54SB66C at 11.0-12.0 ft bgs
1680	12							▽	
							ML	5YR 4/4 reddish brown, silty fine SAND, wet, loose, micaceous	
								10YR 3/1 very dark gray, very fine sandy SILT, wet, soft	
	14		4	3.6	ND		GM	10YR 4/4 dark yellowish brown, GRAVEL/SAND/SILT, wet; gravel, fine to medium and rounded; sand, fine to coarse	
							ML	10YR 4/2 dark grayish brown, SILT, dry, hard to very hard, friable	
	16							Borehole Refusal 15.6 ft bgs	
1675									
	18								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB66

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB67

Sheet 1 of 1

Date(s) Drilled	**8/19/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**16.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1711 msl**
Groundwater Level(s)	**13.1 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							5YR 4/4 reddish brown, very fine SAND and SILT, dry to slightly moist, loose, micaceous, homogeneous	Collected 54SB67A at 0.0-1.0 ft bgs
1710									
	2		1	2.7	ND				
	4							4.6-5.0 ft bgs; 7.5YR 5/4 brown, silty fine SAND layer, dry to slightly moist, loose	
							ML	5.0-5.7 ft bgs; 5YR 4/4 reddish brown, very fine sandy SILT, slightly moist, dense, friable, micaceous	
1705	6		2	3.4	ND			5.7-6.4 ft bgs; silty fine to medium SAND, loose	
	8							8.0-10.3 ft bgs; 5YR 3/4 dark reddish brown, fine sandy SILT, slightly moist, loose, micaceous, homogeneous	Collected 54SB67B at 9.0-10.0 ft bgs
	10		3	4.0	ND				
1700							CL	5YR 3/4 dark reddish brown, silty CLAY, moist, slightly plastic, soft	Collected 54SB67C at 11.0-12.5 ft bgs
	12							5YR 4/4 reddish brown, silty very fine SAND, slightly moist, loose, micaceous	
							ML	12.5-13.1 ft bgs; clayey SILT, very moist, very soft	
								13.1-13.7 ft bgs; 7.5YR 4/3 brown, very fine sandy SILT with trace coarse sand, wet, soft	
	14		4	4.0	ND		SM	7.5YR 4/1 dark gray, silty fine SAND, very loose Grades less silty	
							GP	7.5YR 5/6 strong brown, fine to medium GRAVEL and coarse SAND, loose	
1695	16							Borehole Refusal 16.0 ft bgs	
	18								

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB68

Sheet 1 of 1

Date(s) Drilled	**8/19/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**21.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1701 msl**
Groundwater Level(s)	**20.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							5YR 3/3 dark reddish brown, silty SAND, moist, micaceous, homogeneous	Collected 54SB68A at 0.0-1.0 ft bgs
1700			1	2.9	ND				
	5							4.5-6.8 ft bgs; 7.5YR 4/3 brown, silty fine to medium SAND, moist, medium dense, homogeneous	
1695			2	3.6	ND				
								6.8-8.5 ft bgs; silty fine to medium SAND with some clay	
								Clay grades out at 8.5 ft bgs	
								8.5-8.8 ft bgs; medium SAND layer	
							SM	8.8-18.0 ft bgs; 7.5YR 4/3 brown, silty fine to medium SAND, moist, medium dense, homogeneous	Collected 54SB68B at 9.0-10.0 ft bgs
	10		3	3.7	ND				
1690									
			4	3.5	ND				
	15								
1685									Collected 54SB68C at 16.0-18.0 ft bgs
			5	4.0	ND			18.0-19.0 ft bgs; 7.5YR 4/3 brown, silty fine to medium SAND with some clay, moist	
								19.0-20.0 ft bgs; 7.5YR 5/3 brown, silty fine SAND, very moist, medium dense	
	20							▽ 20.0-20.5 ft bgs; 10YR 4/3 brown, loose to medium dense	
			6	1.0	ND		GM	10YR 4/4 dark yellowish brown, GRAVEL/SAND/SILT, wet; gravel, coarse; sand, medium	
1680								Borehole Refusal 21.0 ft bgs	

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB68

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB69

Sheet 1 of 1

Date(s) Drilled	**8/19/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**15.2 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1691 msl**
Groundwater Level(s)	**14.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1690	0						ML	7.5YR 4/4 brown, SILT and very fine SAND, dry to slightly moist, loose, homogeneous	Collected 54SB69A at 0.0-1.0 ft bgs
								1.3-1.5 ft bgs; fine SAND layer, dry, loose	
	2		1	3.2	ND			2.3-2.5 ft bgs; fine SAND layer, dry, loose	
							SM	2.5YR 3/2 reddish brown, silty fine to medium SAND, dry to slightly moist, medium dense	
	4								
1685							CL	5YR 4/6 yellowish red, fine sandy CLAY, slightly moist, slightly plastic with some highly plastic lenses, medium stiff	
	6		2	3.5	ND				
								7.7-8.5 ft bgs; 7.5YR 5/4 brown, fine SAND, dry, loose	
	8							5YR 4/6 yellowish red, sandy CLAY, slightly moist, slightly plastic, soft	
									Collected 54SB69B and Dup-5 at 9.0-10.0 ft bgs
1680	10		3	3.8	ND		SC	5YR 4/6 yellowish red, clayey SAND, very moist, medium dense	
	12								Collected 54SB69C at 12.0-14.0 ft bgs
							SM	10YR 3/2 dark grayish brown, silty very fine SAND, very moist, micaceous	
			4						
	14			3.2	ND		GM	10YR 3/4 dark yellowish brown, GRAVEL/SAND/SILT, wet; gravel, fine to coarse; sand, fine to coarse	
1675								Borehole Refusal 15.2 ft bgs	
	16								
	18								

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB70

Sheet 1 of 1

Date(s) Drilled	**8/19/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**15.4 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1712 msl**
Groundwater Level(s)	**14.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							5YR 3/4 dark reddish brown, silty fine SAND, slightly moist, loose to medium dense, micaceous, homogeneous	Collected 54SB70A at 0.0-1.0 ft bgs
1710	2		1	2.9	ND				
	4							4.0-8.0 ft bgs; Grades to 5YR 4/4 reddish brown, less silty, moist	
	6		2	3.4	ND				
1705							SM		
	8							8.0-13.4 ft bgs; 5YR 4/6 yellowish red	
	10		3	3.6	ND				Collected 54SB70B at 9.0-10.0 ft bgs
1700								10.5-10.8 ft bgs; 7.5YR 6/6 reddish yellow, SAND layer, loose	
	12								Collected 54SB70C at 12.5-14.0 ft bgs
	14		4	3.1	ND		SP	5YR 4/6 yellowish red, medium SAND, moist to wet, loose ▽	
							GM	5YR 4/6 yellowish red, GRAVEL and SAND with some silt, wet; gravel, fine to medium; sand, medium to coarse	
	16							Borehole Refusal 15.4 ft bgs	
1695									
	18								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB70

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB71

Sheet 1 of 1

Date(s) Drilled	**8/20/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**16.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1696 msl**
Groundwater Level(s)	**13.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill		Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1695	0						ML	7.5YR 3/4 dark brown, fine, sandy SILT, moist, soft Increasing sand	Collected 54SB71A at 0.0-1.0 ft bgs
	2		1	4.0	ND		CH	7.5YR 4/4 brown, CLAY, very stiff, highly plastic Increasing silt	
	4						CL	7.5YR 3/4 dark brown, silty CLAY, moist, slightly plastic, stiff, homogeneous 4.0-6.0 ft bgs; 7.5YR 4/3 brown, fine sandy CLAY, moist, slight plasticity	
1690	6		2	4.0	ND			7.5YR 4/6 strong brown, silty fine SAND, moist, dense	
	8							Decreasing silt	
	10		3	4.0	ND		SM	7.5YR 4/6 strong brown, fine SAND, moist, trace silt	Collected 54SB71B at 9.0-10.0 ft bgs
1685	12							▽	Collected 54SB71C at 12.0-12.8 ft bgs
	14		4	4.0	ND		GM	GRAVEL, SAND, and SILT, wet	
1680	16							Borehole Terminated at 16.0 ft bgs	
	18								

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB72

Sheet 1 of 1

Date(s) Drilled	**8/20/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**15.2 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1697 msl**
Groundwater Level(s)	**10.8 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							0.0-0.3 ft bgs; Thin GRAVEL layer	Collected 54SB72A at 0.0-1.0 ft bgs
								7.5YR 4/4 brown, very fine sandy SILT, slightly moist, very dense	
1695	2		1	4.0	ND		ML		
	4								
	6		2	4.0	ND		SM	5YR 4/6 yellowish red, silty very fine SAND with some clay, moist, dense	
1690									
	8							8.5 ft bgs; Silt and clay grade out	Collected 54SB72B at 9.0-10.0 ft bgs
								5YR 4/6 yellowish red, medium SAND, moist	
	10		3	4.0	ND		SP		Collected 54SB72C at 10.3-10.7 ft bgs
									▽
1685								10YR 4/4 dark yellowish brown, silty medium SAND, wet, loose	
	12						SM		
			4	3.2	ND				
	14							14.0-14.3 ft bgs; GRAVEL layer, wet	
								7.5YR 6/1 gray, silt SAPROLITE, dry, hard	
							Saprolite		
	16							Borehole Refusal 15.2 ft bgs	
1680									
	18								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB72

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB73

Sheet 1 of 1

Date(s) Drilled	**8/20/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**14.7 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1694 msl**
Groundwater Level(s)	**11.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 4/4 brown, silty SAND with some clay, slightly moist, dense, micaceous, homogeneous	Collected 54SB73A at 0.0-1.0 ft bgs
	2		1	3.5	ND		SM		
1690	4							4.5-5.1 ft bgs; Clay grades out	
	6		2	3.7	ND			5.1-6.5 ft bgs; 7.5YR 4/6 strong brown, silty SAND, moist, medium dense, micaceous	
	8						SP	7.5YR 4/6 strong brown, SAND, moist to very moist, loose	Collected 54SB73B at 9.0-10.0 ft bgs
1685	10		3	4.0	ND			11.0 ft bgs; wet	Collected 54SB73C and MS/MSD at 10.0-11.0 ft bgs
	12		4	2.7	ND		GP	7.5YR 4/6 strong brown, GRAVEL and SAND, wet	
1680	14							Borehole Refusal 14.7 ft bgs	
	16								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB73

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB74

Sheet 1 of 1

Date(s) Drilled	**8/20/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**16.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1694 msl**
Groundwater Level(s)	**12.8 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						ML	7.5YR 4/6 brown, SILT with sand, slightly moist, hard, micaceous	Collected 54SB74A and Dup-8 at 0.0-1.0 ft bgs
	2		1	3.2	ND			7.5YR 5/4 brown, silty fine to medium SAND, slightly moist, dense	
1690	4								
	6		2	4.0	ND			5.0-6.5 ft bgs; 5YR 4/6 yellowish red, medium dense	
	8						SM	6.5-12.8 ft bgs; SAND with some silty lenses, moist, loose, micaceous	
1685	10		3	3.6	ND				Collected 54SB74B at 9.0-10.0 ft bgs
	12								Collected 54SB74C at 12.0-12.5 ft bgs
								12.8-15.0 ft bgs; silty SAND with some clay lenses, wet	
1680	14		4	3.6	ND				
	16						GM	5YR 4/6 yellowish red, GRAVEL and SAND with some silt, wet	
								Borehole Terminated 16.0 ft bgs	
	18								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB74

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB75

Sheet 1 of 1

Date(s) Drilled	**8/20/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**20.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1702 msl**
Groundwater Level(s)	**14.8 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
1700	0		1	4.0	ND			7.5YR 4/6 strong brown, silty very fine SAND with some clay, slightly moist, medium dense	Collected 54SB75A at 0.0-1.0 ft bgs
	5		2	4.0	ND		SM	4.0-13.4 ft bgs; Silt and Clay grade out	
1695									
	10		3	4.0	ND				Collected 54SB75B at 9.0-10.0 ft bgs
1690									
			4	3.6	ND		SP	7.5YR 5/4 brown, SAND, moist, loose, homogeneous	Collected 54SB75C at 13.0-14.5 ft bgs
	15							14.8 ft bgs; wet ▽	
1685			5	4.0	ND		GM	7.5YR 5/4 brown, GRAVEL and SAND with some silt, wet	
	20							Borehole Terminated 20.0 ft bgs	
1680									

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB75

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 21355035

Log of Borehole 54SB76

Sheet 1 of 1

Date(s) Drilled	**8/20/2004**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**16.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	**1697 msl**
Groundwater Level(s)	**11.5 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0						SM	10YR 4/3 brown, silty very fine SAND, slightly moist	
								10YR 3/2 very dark grayish brown, gravel/sand/silt with some clay, FILL, moist	
	2		1	3.5	ND				
1695									
	4						Fill		
	6		2	3.0	ND			6.0-10.0 ft bgs; less gravel	
1690									
	8								
	10		3	3.7	ND			10YR 4/4 dark yellowish brown, silty fine SAND, very moist, loose, micaceous	Collected 54SB76C and Dup-7 at 10.0-11.0 ft bgs
							SM		
								▽	
	12							10YR 4/4 dark yellowish brown, fine SAND with gravel, wet	
1685									
	14		4	3.6	ND		SP		
	16							Borehole Terminated 16.0 ft bgs	
1680									
	18								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 9/30/2005 54SB76

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54MW4

Sheet 1 of 1

Date(s) Drilled and Installed	**12/03/1997**	Geologist	**C. Sprinkle**	Reviewer	
Drilling Method	**HSA/Air Hammer**	Drilling Contractor	**Millennium Science & Engineering, Inc.**	Total Depth of Borehole	**45.0 feet**
Sampling Method		Hammer Data		Top of Casing Elevation	**1696.14 msl**
Size and Type of Well Casing	**2-inch I. D. Schedule 40 PVC**	Screen Perforation	**0.010-inch**	Approximate Surface Elevation	**1693.72**
Seal or Backfill	**Bentonite Pellets/Bentonite - cement grout**	Groundwater Level(s)	**Static 17.49 TOC**	Coordinates	**N 10,895,625.6 E 3,602,558.6**

Elevation feet	Depth, feet	SAMPLES Type Number	SAMPLES Blow Counts	SAMPLES Feet Recovery	SAMPLES PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Det.	FIELD NOTES AND WELL DETAILS
	0							Borehole logged from auger returns, Topsoil, medium to dark brown SILT and CLAY		
		1								
1690										
	5							Light brown to moderate brown, SILT and CLAY, trace fine SAND, moist		
		2					ML			Grout: 90% Portland/10% Bentonite
	10									
		3								
1680										
	15							Well rounded GRAVEL and COBBLES (2-3 inches long) with fine SAND, SILT, and CLAY, dusky brown to dusky yellowish brown	▽	
		4					GM			
	20							Boring continued in bedrock with air hammer weathered shaly limestone, alternating layers of rock and soft (clay?) layers		3/8-inch Hydrated Bentonite Pellets
1670										
	25							Dry rock powder until bit at 40 feet		No. 1 Silica Quartz Sandpack
	30						SH/LS			
1660										
	35									Screen: 0.01-inch Factory Slotted, Sch 40, 2-inch PVC
	40							Moist to wet rock powder returns		
1650										
	45							Borehole Terminated at 45.0 ft bgs		

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 3/3/2006 54MW4

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54MW5

Sheet 1 of 1

Date(s) Drilled and Installed	**1/30/2003**	Geologist	**J. Spangler**	Reviewer	**T. LaMaskin**
Drilling Method	**Air Rotary**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**25.0 feet**
Sampling Method	**Geoprobe Macrocore**	Drill Bit Size/Type	**Air hammer/Roller bit**	Top of Casing Elevation	**1698.11 msl**
Size and Type of Well Casing	**4-inch I. D. Schedule 40 PVC**	Screen Perforation	**0.010-inch**	Approximate Surface Elevation	**1695.72 msl**
Seal or Backfill	**Bentonite Pellets/Bentonite - cement grout**	Groundwater Level(s)	**Static 17.47**	Coordinates	**N 10,895,601.4 E 3,602,215.7**

Elevation feet	Depth, feet	SAMPLES Type	Number	Blow Counts	Feet Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Det.	FIELD NOTES AND WELL DETAILS
1695	0								7.5YR 3/4, dark brown, very fine, SANDY SILT, soft, micaceous, moist		
									Increasing sand		
			1	3.3	3.3	ND		ML			Grout: 90% Portland/10% Bentonite
	5								7.5YR 4/6, strong brown, SILTY fine SAND, moist, loose, micaceous		
1690									Increasing sand		
			2	3.5	3.5	ND		SM			3/8-inch Hydrated Bentonite Pellets
									7.5YR 5/6, strong brown, fine SAND, moist, very loose, cohesive, highly micaceous		
			3	1.3	1.3	ND					
	10										No. 1 Silica Quartz Sandpack
1685								SP			
	15								15.0-17.0 ft bgs; 7.5YR 5/4, brown, fine to coarse, GRAVELLY SAND, wet, well rounded, loose		
1680			4	1.2	1.2	ND					
									Blue gray Limestone; Sampler refusal at 17.0 ft bgs ▽		Screen: 0.01-inch Factory Slotted, Sch 40, 4-inch PVC
	20										
1675								LS			
											No. 1 Silica Quartz Sand
	25										
1670									Borehole terminated at 25.0 ft bgs. 54MW5 installed		

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 3/3/2006 54MW5

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54MW6

Sheet 1 of 1

Date(s) Drilled and Installed	**1/28/2003**	Geologist	**J. Spangler**	Reviewer	**T. LaMaskin**
Drilling Method	**Air Rotary**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**42.0 feet**
Sampling Method	**Geoprobe Macrocore**	Drill Bit Size/Type	**Air hammer/Roller bit**	Top of Casing Elevation	**1739.19 msl**
Size and Type of Well Casing	**4-inch I. D. Schedule 40 PVC**	Screen Perforation	**0.010-inch**	Approximate Surface Elevation	**1736.74 msl**
Seal or Backfill	**Bentonite Pellets/Bentonite - cement grout**	Groundwater Level(s)	**Static 36.92 bgs**	Coordinates	**N 10,895,234.1 E 3,602,506.4**

Elevation feet	Depth, feet	SAMPLES Type	Number	Feet Recovered	Feet Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Det.	FIELD NOTES AND WELL DETAILS
	0								10YR 3/4, dark brown, SANDY SILT, moist, trace clay, hard		
									0.4 ft bgs; 10YR 4/4, dark yellowish brown, SILTY fine SAND, moist, dense		
			1	4.0	4.0	ND			Trace clay		
	5								5.2 ft bgs; 7.5YR 5/6, strong brown, SILTY fine SAND, moist, medium dense, loose, micaceous		
1730			2	4.0	4.0	ND			Grading loose		Grout: 90% Portland/10% Bentonite
									Slightly clayey		
	10		3	2.0	2.0	ND		SM			3/8-inch Hydrated Bentonite Pellets
	15								15.0-20.0 ft bgs; 7.5YR 5/6, strong brown, SILTY fine SAND, moist, homogenous, loose		No. 1 Silica Quartz Sandpack
1720			4		2.0	ND					
	20		5		0.5	ND		SP	7.5YR 5/6, strong brown, fine to coarse, SAND and GRAVEL, moist		
									Sampler refusal in SAND and GRAVEL at 20.5 ft bgs		
									Blue gray Limestone		
	25								Gravelly		
1710											
	30							LS			Screen: 0.01-inch Factory Slotted, Sch 40, 4-inch PVC
									Blue gray Limestone		
	35									▽	
1700											
	40								Borehole Terminated 42.0 ft bgs		
									54MW6 installed		

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 3/3/2006 54MW6

URS

Project: RFAAP SWMU 54 **Project Location: Radford, Virginia** **Project Number: 21355035**	**Log of Borehole 54MW7** Sheet 1 of 1

Date(s) Drilled and Installed	**1/29/2003**	Geologist	**J. Spangler**	Reviewer	**T. LaMaskin**
Drilling Method	**Air Rotary**	Drilling Contractor	**Richard Simmons Drilling Co., Inc.**	Total Depth of Borehole	**23.0 feet**
Sampling Method	**Geoprobe Macrocore**	Drill Bit Size/Type	**Air hammer/Roller bit**	Top of Casing Elevation	**1696.58 msl**
Size and Type of Well Casing	**4-inch I. D. Schedule 40 PVC**	Screen Perforation	**0.010-inch**	Approximate Surface Elevation	**1694.15 msl**
Seal or Backfill	**Bentonite Pellets/Bentonite - cement grout**	Groundwater Level(s)	**Static 15.68 bgs**	Coordinates	**N 10,895,609.2 E 3,602,458.4**

Elevation feet	Depth, feet	SAMPLES Type	Number	Feet Recovered	Feet Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Det.	FIELD NOTES AND WELL DETAILS
	0								7.5YR 3/6, dark yellowish brown, very fine SANDY SILT, moist, trace clay, dense, micaceous		
			1	3.5	3.5	ND			Increasing clay		Grout: 90% Portland/10% Bentonite
1690	5		2	3.4	3.4	ND			4.0-8.0 ft bgs; 7.5YR 4/4, brown, very fine, SANDY CLAYEY SILT, moist, soft, micaceous		3/8-inch Hydrated Bentonite Pellets
								SM/ML	Increasing sand		
1685	10		3	4.0	2.0	ND					No. 1 Silica Quartz Sandpack
1680	15		4	2.0	1.0	ND		GP	7.5YR 5/6, strong brown, medium to coarse, SAND and well rounded GRAVEL, wet ▽		
								Saprolite	GLEY 1 5/1, greenish gray, SAPROLITE with fat CLAY, weathered		Screen: 0.01-inch Factory Slotted, Sch 40, 4-inch PVC
1675	20							LS	Greenish gray limestone		
1670	25								Borehole terminated at 23.0 ft bgs 54MW7 installed		

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 3/3/2006 54MW7

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54MW8

Sheet 1 of 1

Date(s) Drilled and Installed	**12/9/2004**	Geologist	**J. Spangler**	Reviewer	**B. Fisher**
Drilling Method	**Air Rotary**	Drilling Contractor	**Parratt Wolff Drilling**	Total Depth of Borehole	**34.0 feet**
Sampling Method	**Geoprobe Macrocore**	Drill Bit Size/Type	**Air hammer/Roller bit**	Top of Casing Elevation	**1692.64 msl**
Size and Type of Well Casing	**4-inch I. D. Schedule 40 PVC**	Screen Perforation	**0.010-inch**	Approximate Surface Elevation	**1690.07 msl**
Seal or Backfill	**Bentonite Pellets/Bentonite - cement grout**	Groundwater Level(s)	**Static 15.16 bgs**	Coordinates	**N 10,895,859.6 3,602,012.5**

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
1690	0							Silty SAND, moist	
	5						SM		Grout: 90% Portland/10% Bentonite
1680	10								3/8-inch Hydrated Bentonite Pellets
									No. 1 Silica Quartz Sandpack
	15						GM	Cobbles, GRAVEL	
							Saprolite	Weathered rock, siltstone, and saprolite	
1670	20							Limestone with some weathered saprolite zones	Screen: 0.01-inch Factory Slotted, Sch 40, 4-inch PVC
	25						LS		
1660	30							Compotent Limestone bedrock, unweathered	31.4-34.0 ft bgs; slough and cave in soils
	35							Borehole Terminated at 34.0 ft bgs 54MW8 installed	

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 3/3/2006 54MW8

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54MW9

Sheet 1 of 1

Date(s) Drilled and Installed	**12/8/2004**	Geologist	**J. Spangler**	Reviewer	**B. Fisher**
Drilling Method	**Air Rotary**	Drilling Contractor	**Parratt Wolff Drilling**	Total Depth of Borehole	**28.5 feet**
Sampling Method	**Geoprobe Macrocore**	Drill Bit Size/Type	**Air hammer/Roller bit**	Top of Casing Elevation	**1696.04 msl**
Size and Type of Well Casing	**4-inch I. D. Schedule 40 PVC**	Screen Perforation	**0.010-inch**	Approximate Surface Elevation	**1694.11 msl**
Seal or Backfill	**Bentonite Pellets/Bentonite - cement grout**	Groundwater Level(s)	**Static 18.43 bgs**	Coordinates	**N 10,895,849.8 E 3,602,464.3**

Elevation feet	Depth, feet	SAMPLES Type Number	SAMPLES Feet Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
	0						7.5YR 3/3 dark brown, very fine sandy SILT, moist, loose, micaceous	
1690						ML		
	5						7.5 ft bgs; 7.5YR 4/3 brown, silty very fine SAND, moist, loose, micaceous	Grout: 90% Portland/10% Bentonite
1685								
	10					SM	Increasing moisture	
							12.5 ft bgs; 7.5YR 4/4 brown, fine to medium SAND with some silt, moist, loose micaceous	3/8-inch Hydrated Bentonite Pellets
1680								
	15						15.0 ft bgs; 7.5YR 4/6 strong brown, silty medium SAND, very moist, loose	No. 1 Silica Quartz Sandpack
							17.3 ft bgs; medium SAND with little silt, wet, poorly graded Gravel and cobbles, wet	
1675						GM	Limestone bedrock, competent	
	20							Screen: 0.01-inch Factory Slotted, Sch 40, 4-inch PVC
						LS		
1670								
	25						Weathered limestone and saprolite, not competent at 26.0 ft bgs	
1665							Borehole Terminated at 28.5 ft bgs 54MW9 installed	
	30							

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 3/3/2006 54MW9

URS

Project: RFAAP SWMU 54
Project Location: Radford, Virginia
Project Number: 21355035

Log of Borehole 54MW10

Sheet 1 of 1

Date(s) Drilled and Installed	**12/13/2004**	Geologist	**J. Spangler**	Reviewer	**B. Fisher**
Drilling Method	**Air Rotary**	Drilling Contractor	**Parratt Wolff Drilling**	Total Depth of Borehole	**35.0 feet**
Sampling Method	**Geoprobe Macrocore**	Drill Bit Size/Type	**Air hammer/Roller bit**	Top of Casing Elevation	**1691.10 msl**
Size and Type of Well Casing	**4-inch I. D. Schedule 40 PVC**	Screen Perforation	**0.010-inch**	Approximate Surface Elevation	**1688.90 msl**
Seal or Backfill	**Bentonite Pellets/Bentonite - cement grout**	Groundwater Level(s)	**Static 13.75**	Coordinates	**N 10,895,890.4 E 3,602,211.1**

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES AND WELL DETAILS
	0							Silty SAND	Grout: 90% Portland/10% Bentonite
	5								3/8-inch Hydrated Bentonite Pellets
1680							SM		
	10								No. 1 Silica Quartz Sandpack
	15							GRAVEL and Cobbles	
							GM		
1670								Gray, Weathered limestone and saprolite	
	20								Screen: 0.01-inch Factory Slotted, Sch 40, 4-inch PVC
	25						LS		
1660								Siltstone and shale with some clay lenses	
	30						SS/SH	Weathered rock, silty, not competent	
							LS		32.0-35.0 ft bgs; slough and cave in soils
	35							Borehole Terminated 35.0 ft bgs 54MW10 installed	

Report: ENV_12W_CLEVELAND+/-USCS; File: RFAAP54.GPJ; 3/3/2006 54MW10

URS

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 11656351

Log of Borehole 54SB77

Sheet 1 of 1

Date(s) Drilled	**1/9/2007**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**12.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	
Groundwater Level(s)	**10.8 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Coordinates	**N 3,602,703.5 E 10,895,497.4**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 4/3 brown, fine sandy SILT, moist, medium stiff	
	1								Collected 54SB77A at 0.0-0.5 ft bgs.
	2		1	4	ND		ML		
	3								
	4							7.5YR 4/6 strong brown, silty SAND, fine, micaceous, loose	
	5							Perched water at 5.1 - 5.6 ft bgs	
	6		2	4	ND				
	7							Fine medium silty SAND	Collected 54SB77B at 7.0-8.0 ft bgs.
	8						SM		
	9								
	10		3	4	ND				Collected 54SB77C at 10.0-11.0 ft bgs.
	11							Wet at 10.8 ft bgs ▽	
	12							Borehole Terminated 12.0 ft bgs	
	13								
	14								
	15								

Report: ENV_12AS_NORTH/EAST+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 7/16/2007 54SB77

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 11656351

Log of Borehole 54SB78

Sheet 1 of 1

Date(s) Drilled	**1/9/2007**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**16.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	
Groundwater Level(s)	**14.6 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Coordinates	**N 3,602,654.8 E 10,895,441.7**		

Elevation, feet / Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
0							7.5YR 3/4 dark brown, sandy SILT, moist, soft	
2		1	4	ND		ML		Collected 54SB78A at 0.0-0.5 ft bgs.
4							7.5YR 4/3 brown, silty fine SAND, moist, micaceous	
6		2	4	ND			Same, 7.5YR 4/6 strong brown	
8								
10		3	4	ND		SM	Less silt, loose, very fine SAND, micaceous	Collected 54SB78B at 9-10 ft bgs.
12								
14		4	4	ND			Wet at 14.6 ft bgs.	Collected 54SB78C at 13.5-14.5 ft bgs.
16							Boring Terminated at 16.0 ft bgs	
18								

Report: ENV_12AS_NORTH/EAST+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 7/16/2007 54SB78

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 11656351

Log of Borehole 54SB79

Sheet 1 of 1

Date(s) Drilled	**1/9/2007**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**12.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	
Groundwater Level(s)	**10.6 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Coordinates	**N 3,602,669.5 E 10,895,498.2**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							7.5YR 4/3 brown, very fine sandy SILT, moist, medium stiff	
	1								Collected 54SB79A at 0.0-0.5 ft bgs.
	2		1	4	ND		ML		
	3							7.5YR 4/6 strong brown, silty fine SAND, moist, micaceous, soft, moist	
	4								
	5							Perched water 5.0-6.0 ft bgs	
	6		2	4	ND				
	7						SM	Same grading, less silt	Collected 54SB79B at 7.0-8.0 ft bgs.
	8								
	9								
	10		3	4	ND			Wet at 10.6 ft bgs ▽	Collected 54SB79C at 9.5-10.5 ft bgs.
	11								
	12							Boring Terminated at 12.0 ft bgs	
	13								
	14								

Report: ENV_12AS_NORTH/EAST+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 7/16/2007 54SB79

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 11656351

Log of Borehole 54SB80

Sheet 1 of 1

Date(s) Drilled	**1/9/2007**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**12.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	
Groundwater Level(s)	**10.5 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Coordinates	**N 3,602,649.2 E 10,895,556.6**		

Elevation, feet / Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
0							7.5YR 3/4 dark brown, SILT, with trace to little sand, moist, soft, elastic, grading sandy with depth	
1								Collected 54SB80A at 0-0.5 ft bgs.
2		1	4	ND				
3								
4						ML		
5							7.5YR 4/4 brown, very fine sandy SILT, moist, micaceous, medium stiff	Collected 54SB80B at 5.0-6.0 ft bgs.
6		2	4	ND				
7								
8							7.5YR 4/4 brown, silty fine SAND, micaceous	
9								Collected 54SB80C at 9.0-10.0 ft bgs.
10		3	4	ND		SM		
11							Wet at 10.5 ft bgs ▽	
12							Boring Terminated at 12.0 ft bgs	
13								
14								

Report: ENV_12AS_NORTH/EAST+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 7/16/2007 54SB80

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 11656351

Log of Borehole 54SB81

Sheet 1 of 1

Date(s) Drilled	**1/10/2007**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**24.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	
Groundwater Level(s)	**20.5 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Coordinates	**N 3,601,984.7 E 10,895,736.5**		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0		1	3	ND		SM	7.5YR 4/6 strong brown, fine silty SAND, moist, loose, micaceous, no stains or odor	Collected 54SB81A at 0.0-0.5 ft bgs.
	5		2	3	ND		SP	Silt grades out at 3.8 ft bgs	
	10		3	3	ND				Collected 54SB81B at 9.0-10.0 ft bgs.
	15		4	4	ND		SM	Grading more silt	
			4	4	ND			Increasing silt	Collected 54SB81C at 19.0-20.0 ft bgs.
	20		5	4	ND		ML	Wet at 20.5 ft bgs 7.5YR 4/6 strong brown SILT, sandy, sticky 10YR 4/2 dark grayish brown, sandy SILT with some clay, elastice, micaceous	
							GW	Well graded gravel, fine to course, with little fines	
	25							Boring Refusal at 24.0 ft bgs.	

Report: ENV_12AS_NORTH/EAST+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 7/16/2007 54SB81

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 11656351

Log of Borehole 54SB82

Sheet 1 of 2

Date(s) Drilled	**1/12/2007**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**24.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	
Groundwater Level(s)	**20.0 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Coordinates	**N 3,602,040.5 E 10,895,724.8**		

Elevation, feet / Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
0							7.5YR 4/4 brown, very fine silty SAND, moist, loose	
1								Collected 54SB82A at 0.0-0.5 ft bgs.
2		1	3	ND				
3								
4								
5						SM	Very moist at 4.5-5.5 ft bgs	
6		2	3	ND				
7								
8								
9								Collected 54SB82B at 9.0-10.0 ft bgs.
10		3	4	ND			7.5YR 4/4 brown, clayey SILT with some sand, very moist, very soft, elastic, clay, slightly plastic	
11								
12						ML		
13								
14								

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 11656351

Log of Borehole 54SB82

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	14		4	3	ND			Very fine to fine silty SAND, medium dense	
	15							Very fine silty SAND, very moist, soft, micaceous	
	16								
	17								
	18		4	4	ND		SM		Collected 54SB82C at 18.0-19.0 ft bgs.
	19								
	20							Wet at 20.0 ft bgs ▽	
	21								
	22		5	4	ND				
							SP	10YR 5/2 grayish brown, SAND	
	23						GW	Very fine to medium GRAVEL with fine to coarse sand, trace coarse gravel	
	24							Boring Refusal at 24.0 ft bgs	
	25								
	26								
	27								
	28								
	29								
	30								

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 11656351

Log of Borehole 54SB83

Sheet 1 of 2

Date(s) Drilled	**1/11/2007**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**24.0 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	
Groundwater Level(s)	**22.5 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Coordinates	**N 3,602,188.5 E 10,895,761.4**		

Elevation, feet / Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
0							7.5YR 3/4 dark brown, silty SAND, very moist, micaceous, loose	
1								Collected 54SB83A at 0.0-0.5 ft bgs.
2		1	3	ND				
3							Very moist at 3.5 ft bgs	
4							7.5YR 4/4 brown SAND with trace to little silt, moist, fine, loose	
5						SM		
6		2	4	ND			Sand grades to medium	
7								
8								
9								Collected 54SB83B at 9.0-10.0 ft bgs.
10		3	4	ND			7.5YR 4/6 strong brown, silty CLAY with some very fine sand	
11						CL	7.5YR 4/6 strong brown, very soft, very fine sandy SILT with some clay, very moist, slightly elastic	
12								

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 11656351

Log of Borehole 54SB83

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	SAMPLES Feet Recovery	SAMPLES PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	12								
	13						ML	7.5YR 4/6 strong brown, very soft, very fine sandy SILT with some clay, very moist, slightly elastic	
	14		4	4	ND				
	15							Strong brown, silty fine to medium SAND, very moist, loose, micaceous	
	16								
	17								
	18		4	4	ND		SM		
	19								
	20							Strong brown, very fine silty SAND, very moist, loose, micaceous	
	21								Collected 54SB83C at 21.0-22.0 ft bgs.
	22		5	4	ND			Strong brown silty CLAY, moist, slightly plastic, soft	
							SP	7.5YR 5/7 brown, SAND, wet, loose ▽	
	23						GW	Well graded GRAVEL, fine to coarse	
	24							Boring Refusal at 24.0 ft bgs	
	25								
	26								

Report: ENV_12AS_NORTH/EAST+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 7/16/2007 54SB83

Project: Radford Army Ammunition Plant
Project Location: SWMU 54
Project Number: 11656351

Log of Borehole 54SB84

Sheet 1 of 1

Date(s) Drilled	**1/11/2007**	Logged By	**John Spangler**	Reviewed By	**Brett Fisher**
Drilling Method	**Geoprobe-Direct Push Technology**	Drilling Contractor	**Richard Simmons Drilling**	Total Depth of Borehole	**17.6 feet**
Drill Rig Type	**Tractor Mounted Geoprobe Unit**	Drill Bit Size/Type	**4-foot x 2-inch macrocore**	Ground Surface Elevation	
Groundwater Level(s)	**16.2 ft bgs**	Sampling Method	**Macrocore disposable acetate liner**	Hammer Data	**NA**
Borehole Backfill	**3/8-inch bentonite pellets**	Coordinates	**N 3,602,097.6 E 10,895,586.8**		

Elevation, feet / Downhole Depth, feet	SAMPLES Type	Number	Feet Recovery	PID	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
0							7.5YR 4/4 brown, fine sandy SILT, moist, soft, grading less silt	Collected 54SB84A at 0.0-0.5 ft bgs.
2		1	3	ND		ML		
4							7.5YR 1/4 brown SILT with trace to little sand, very moist, micaceous, soft	
6		2	4	ND			7.5YR 5/6 strong brown, silty fine SAND, micaceous, medium dense	
8								Collected 54SB84B at 9.0-10.0 ft bgs.
10		3	4	ND		SM		
12								
14		4	4	ND			7.5YR 4/4 brown, very fine SAND and SILT, with trace to little clay, moist	Collected 54SB84C at 15.0-16.0 ft bgs.
16							7.5YR 4/2 brown very fine sany SILT with some clay, micaceous, soft ▽	
		5	2	ND		GW	Well graded GRAVEL, wet at 16.2 ft bgs	
18							Boring Refusal at 17.6 ft bgs	

Report: ENV_12AS_NORTH/EAST+/-USCS; File: RFAAP_54 ADD CHAR.GPJ; 7/16/2007 54SB84

APPENDIX C.4

SLUG TEST DATA

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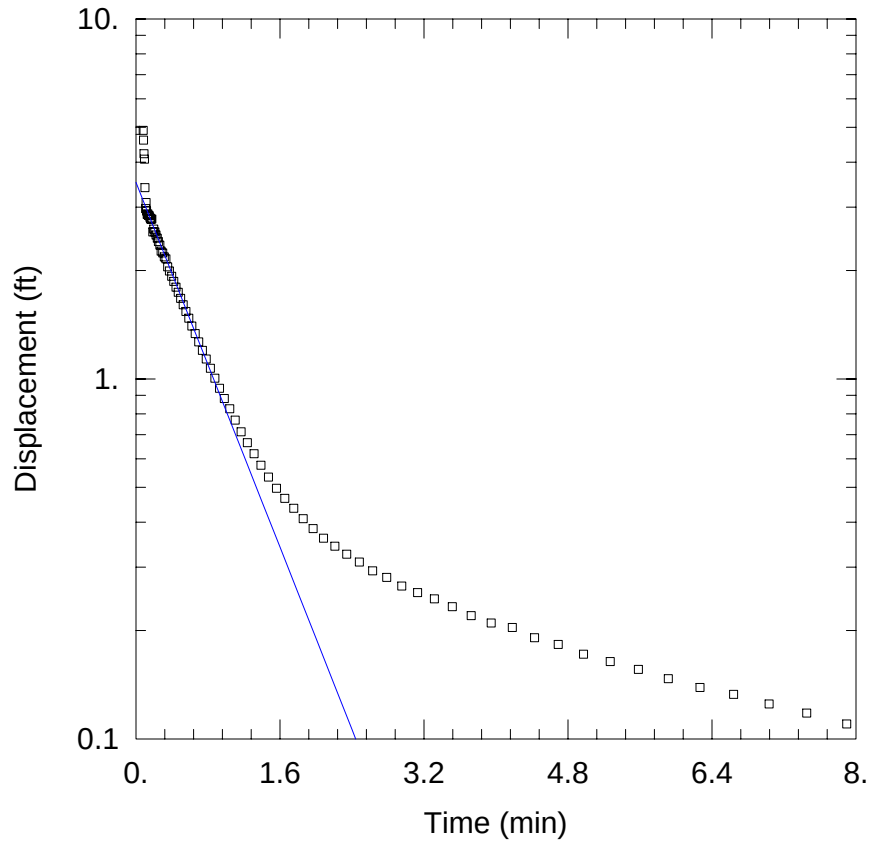


54MW4 FALLING HEAD

Data Set: P:\...\54MW4FALL.aqt
Date: 06/19/07 Time: 16:26:36

PROJECT INFORMATION

Company: URS Corporation
Client: USACE Balt. Dist.
Project: 09604-263-155
Test Location: RFAAP SWMU 54
Test Well: MW-4
Test Date: 03/06/03

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0005832 cm/sec
y0 = 3.514 ft

AQUIFER DATA

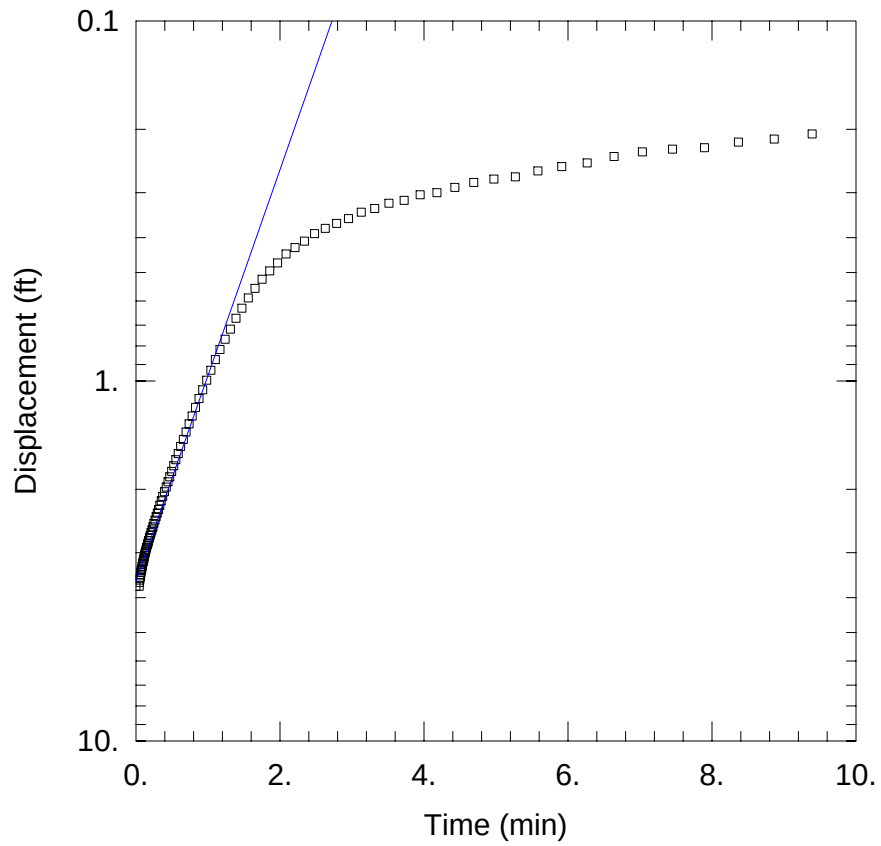
Saturated Thickness: 33.34 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-4)

Initial Displacement: 4.905 ft
Wellbore Radius: 0.333 ft
Screen Length: 15. ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.083 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 34.7 ft



54MW4 RISING HEAD

Data Set: P:\...\54MW4RISE.aqt
Date: 06/19/07 Time: 16:31:57

PROJECT INFORMATION

Company: URS Corporation
Client: USACE Balt. Dist.
Project: 09604-263-155
Test Location: RFAAP SWMU 54
Test Well: MW-4
Test Date: 03/06/03

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0005269 cm/sec
y0 = 3.6 ft

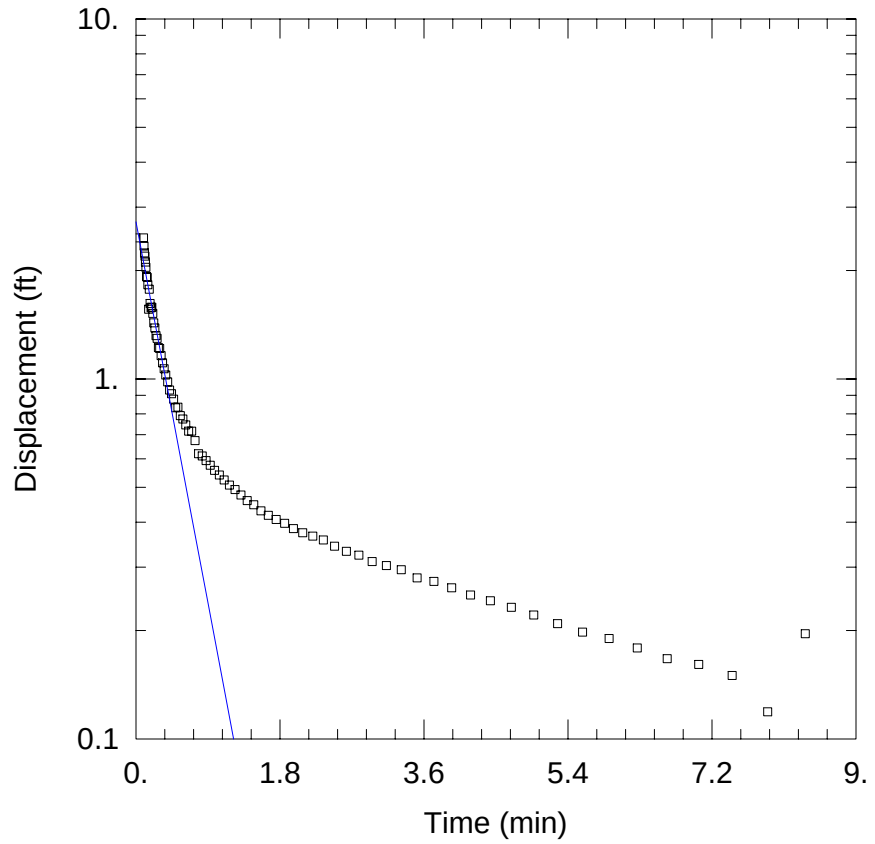
AQUIFER DATA

Saturated Thickness: 33.55 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-4)

Initial Displacement: 3.718 ft
Wellbore Radius: 0.333 ft
Screen Length: 15. ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.083 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 34.91 ft



54MW-5 FALLING HEAD

Data Set: P:\...\54MW5FALL.aqt
Date: 06/19/07 Time: 16:45:28

PROJECT INFORMATION

Company: URS Corporation
Client: USACE Balt. Dist.
Project: 09604-263-155
Test Location: RFAAP
Test Well: 54MW5
Test Date: 3/6/03

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.00373 cm/sec
y0 = 2.729 ft

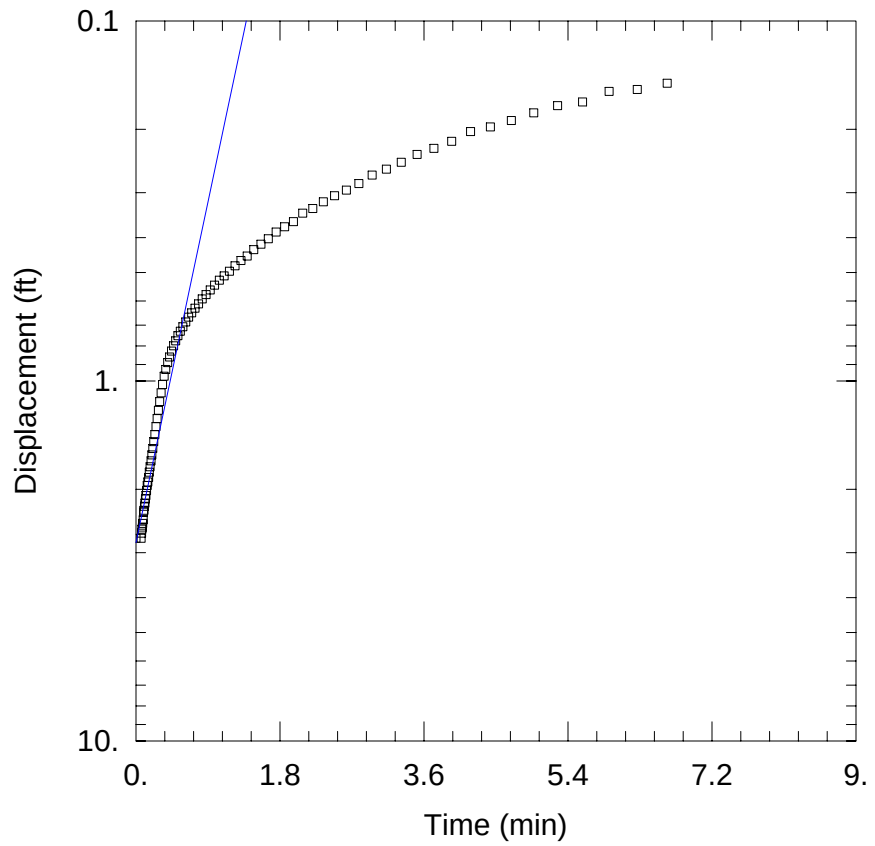
AQUIFER DATA

Saturated Thickness: 30.76 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5)

Initial Displacement: 2.465 ft
Wellbore Radius: 0.458 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.167 ft
Well Skin Radius: 0.458 ft
Total Well Penetration Depth: 10.37 ft



54MW-5 RISING HEAD

Data Set: P:\...\54MW5RISE.aqt
Date: 06/19/07 Time: 16:32:46

PROJECT INFORMATION

Company: URS Corporation
Client: USACE Balt. Dist.
Project: 09604-263-155
Test Location: RFAAP
Test Well: 54MW5
Test Date: 3/6/03

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

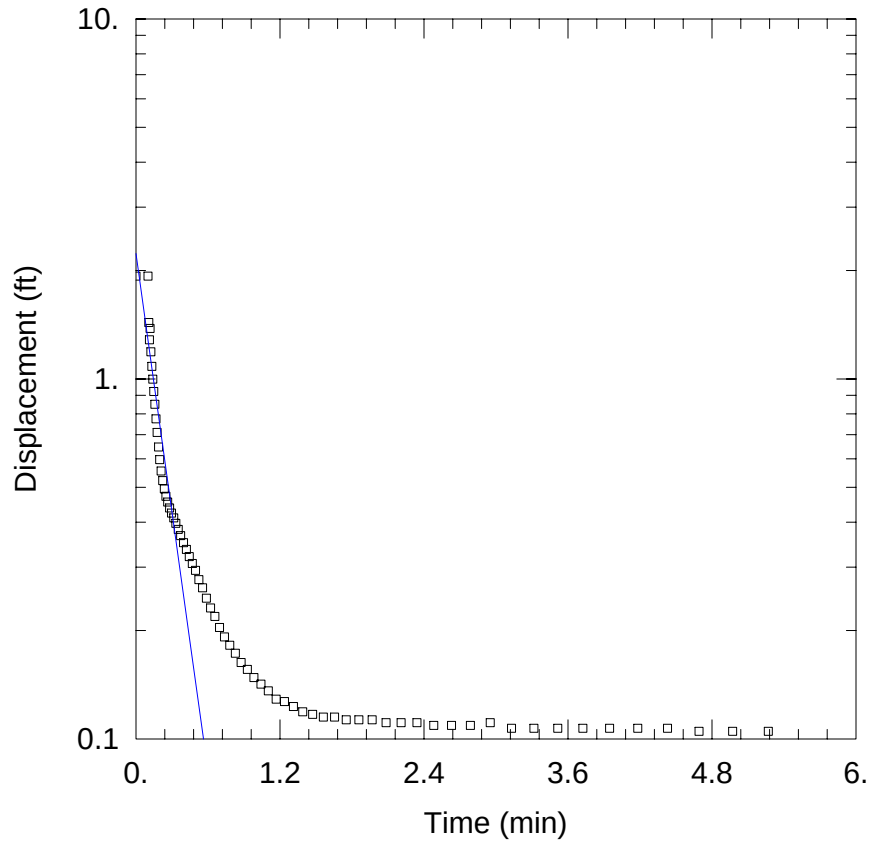
K = 0.003322 cm/sec
y0 = 2.813 ft

AQUIFER DATA

Saturated Thickness: 30.57 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-5)

Initial Displacement: 2.737 ft
Wellbore Radius: 0.458 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.167 ft
Well Skin Radius: 0.458 ft
Total Well Penetration Depth: 10.18 ft



54MW-6 FALLING HEAD

Data Set: P:\...\54MW6FALL.aqt
Date: 06/19/07 Time: 16:28:36

PROJECT INFORMATION

Company: URS Corporation
Client: USACE Balt. Dist.
Project: 09604-263-155
Test Location: RFAAP
Test Well: 54MW6
Test Date: 3/6/03

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.004998 cm/sec
y0 = 2.23 ft

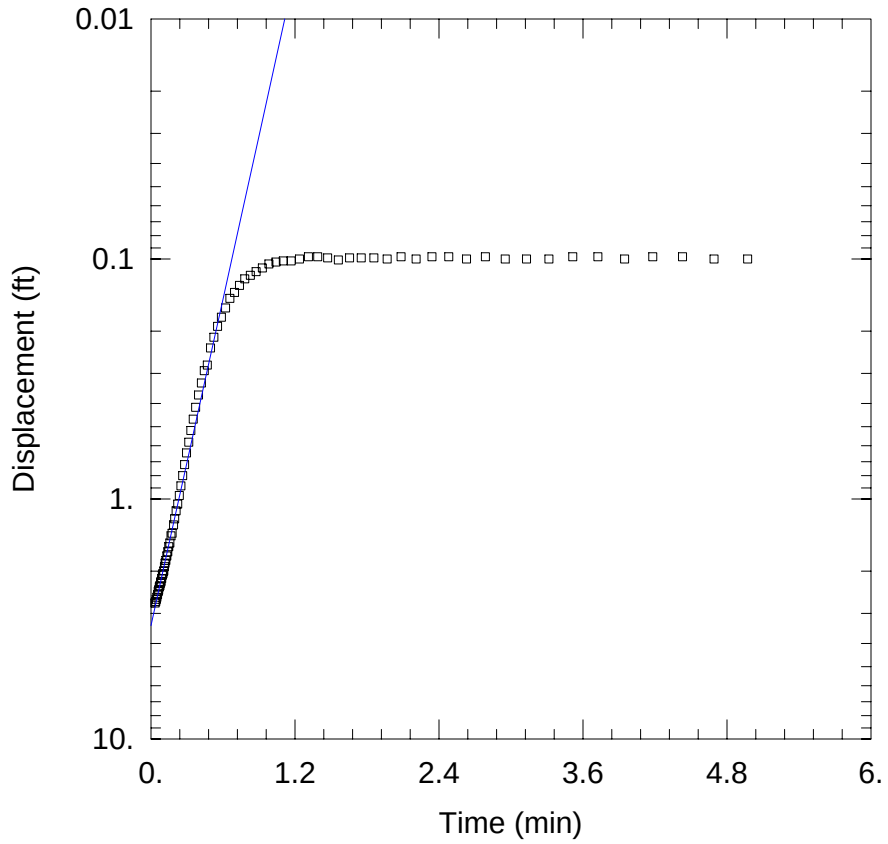
AQUIFER DATA

Saturated Thickness: 18.85 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (54MW-6)

Initial Displacement: 1.93 ft
Wellbore Radius: 0.333 ft
Screen Length: 15. ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.167 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 4.66 ft



54MW-6 RISING HEAD

Data Set: P:\...\54MW6RISE.aqt
Date: 06/19/07 Time: 16:33:40

PROJECT INFORMATION

Company: URS Corporation
Client: USACE Balt. Dist.
Project: 09604-263-155
Test Location: RFAAP
Test Well: 54MW6
Test Date: 3/6/03

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

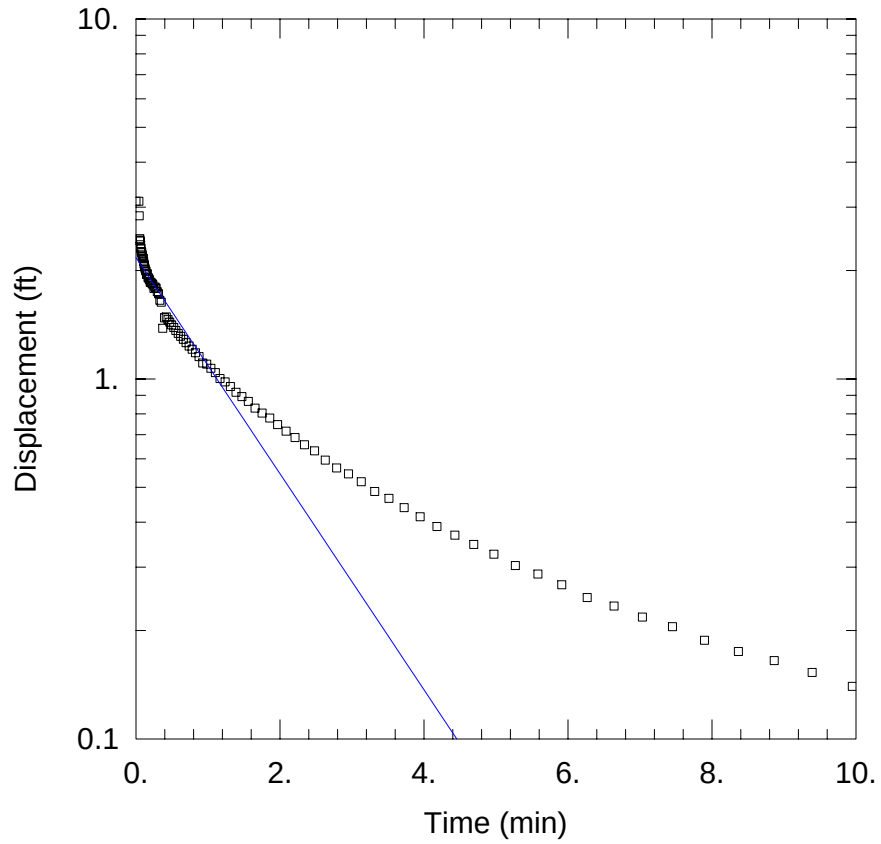
K = 0.00476 cm/sec
y0 = 3.369 ft

AQUIFER DATA

Saturated Thickness: 18.95 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (54MW-6)

Initial Displacement: 2.713 ft
Wellbore Radius: 0.333 ft
Screen Length: 15. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.167 ft
Well Skin Radius: 0.333 ft
Total Well Penetration Depth: 4.76 ft



54MW-7 FALLING HEAD

Data Set: P:\...\54MW7FALL.aqt
Date: 06/19/07 Time: 16:29:33

PROJECT INFORMATION

Company: URS Corporation
Client: USACE Balt. Dist.
Project: 09604-263-155
Test Location: RFAAP
Test Well: 54MW-7
Test Date: 3/6/03

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.000984 cm/sec
y0 = 2.172 ft

AQUIFER DATA

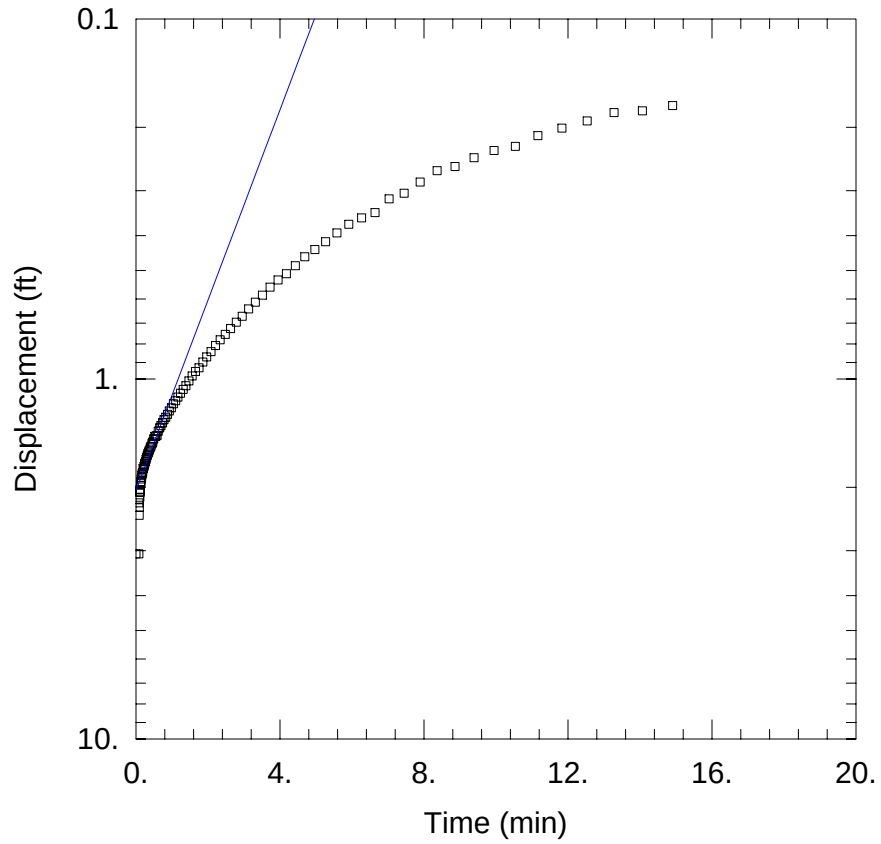
Saturated Thickness: 28.49 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (54MW-7)

Initial Displacement: 3.115 ft
Wellbore Radius: 0.458 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.167 ft
Well Skin Radius: 0.458 ft
Total Well Penetration Depth: 11.75 ft



54MW-7 RISING HEAD

Data Set: P:\...\54MW7RISE.aqt
Date: 06/19/07 Time: 16:34:04

PROJECT INFORMATION

Company: URS Corporation
Client: USACE Balt. Dist.
Project: 09604-263-155
Test Location: RFAAP
Test Well: 54MW-7
Test Date: 3/6/03

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0008645 cm/sec
y0 = 2.041 ft

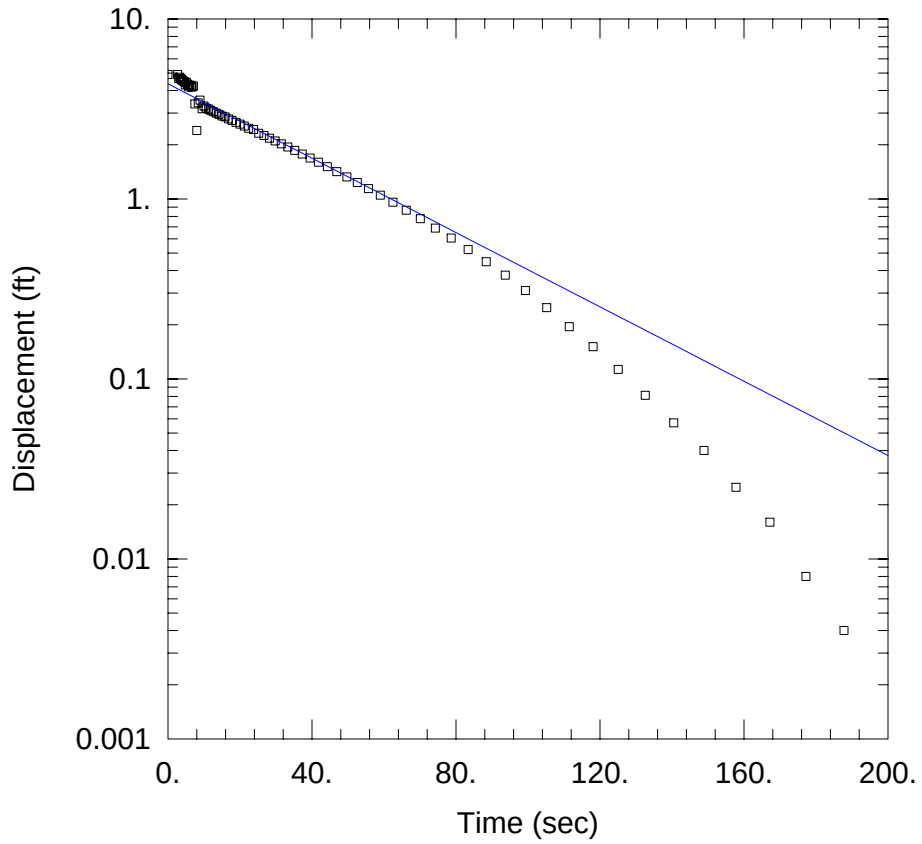
AQUIFER DATA

Saturated Thickness: 28.34 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (54MW-7)

Initial Displacement: 3.062 ft
Wellbore Radius: 0.458 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.167 ft
Well Skin Radius: 0.458 ft
Total Well Penetration Depth: 11.6 ft



54MW8 FALLING HEAD

Data Set: P:\...\54MW8FALL.aqt
Date: 06/19/07 Time: 16:30:20

PROJECT INFORMATION

Company: URS Group
Client: RFAAP
Project: 21355035
Test Location: Radford, VA
Test Well: 54MW8
Test Date: March 2, 2005

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

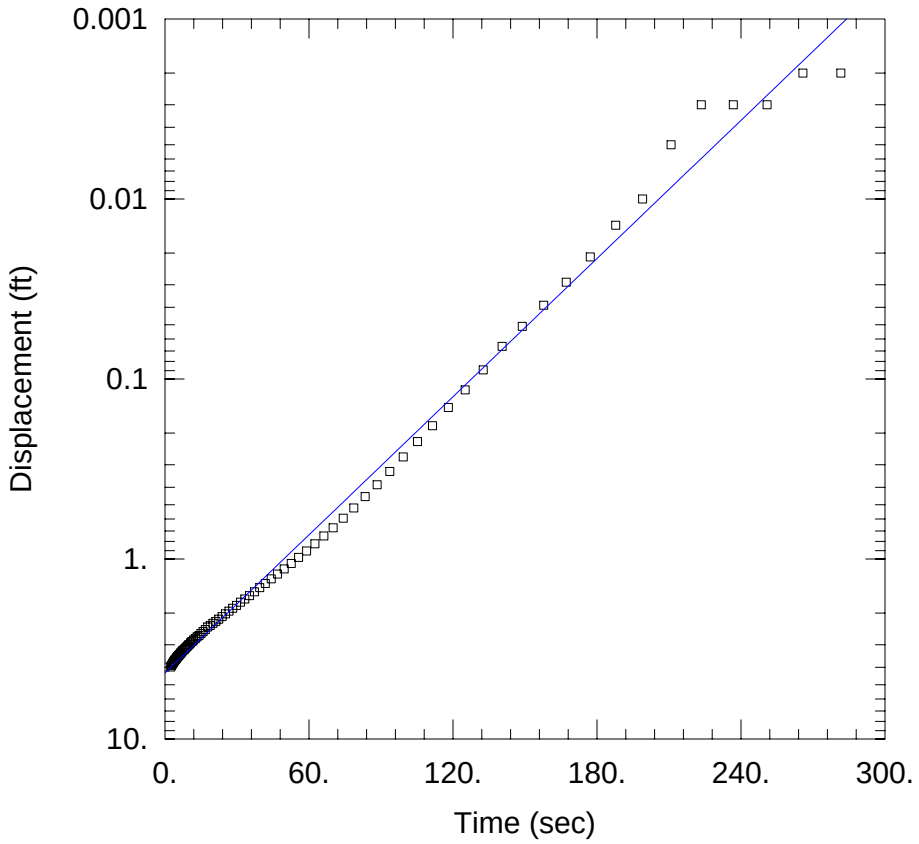
K = 0.001587 cm/sec
y0 = 4.358 ft

AQUIFER DATA

Saturated Thickness: 32.4 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (54MW10)

Initial Displacement: 4.912 ft
Wellbore Radius: 0.458 ft
Screen Length: 15. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.167 ft
Well Skin Radius: 0.458 ft
Total Well Penetration Depth: 17.25 ft



54MW8 RISING HEAD

Data Set: P:\...\54MW8RISE.aqt
Date: 06/19/07 Time: 16:34:30

PROJECT INFORMATION

Company: URS Group
Client: RFAAP
Project: 21355035
Test Location: Radford, VA
Test Well: 54MW8
Test Date: March 3, 2005

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

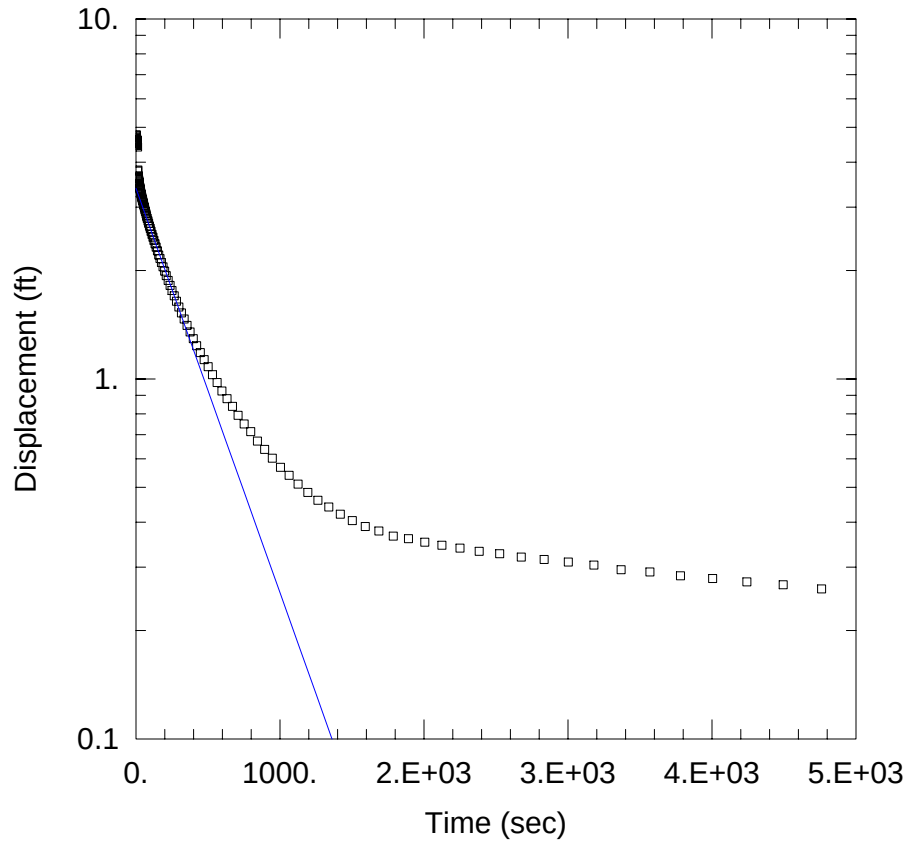
K = 0.001957 cm/sec
y0 = 4.308 ft

AQUIFER DATA

Saturated Thickness: 31.96 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (54MW8)

Initial Displacement: 3.986 ft
Wellbore Radius: 0.458 ft
Screen Length: 15. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.167 ft
Well Skin Radius: 0.458 ft
Total Well Penetration Depth: 16.81 ft



54MW9 FALLING HEAD

Data Set: P:\...\54MW9FALL.aqt
Date: 06/19/07 Time: 16:30:48

PROJECT INFORMATION

Company: URS Group
Client: RFAAP
Project: 21355035
Test Location: Radford, VA
Test Well: 54MW9
Test Date: March 3, 2005

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0002182 cm/sec
y0 = 3.385 ft

AQUIFER DATA

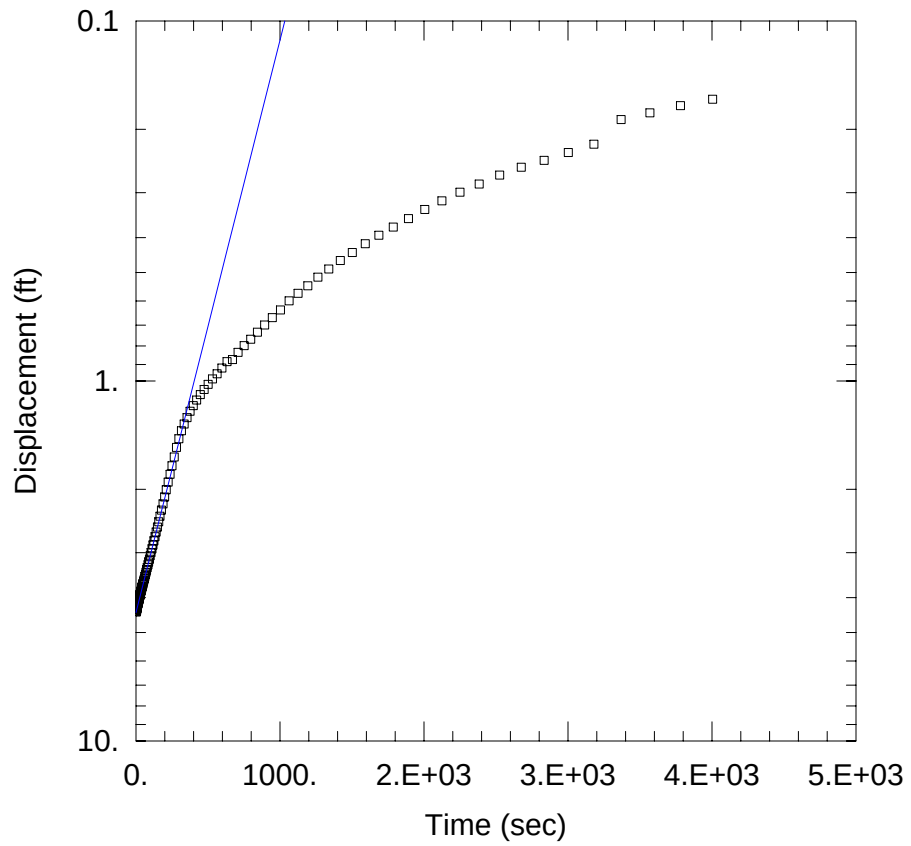
Saturated Thickness: 27.95 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (54MW9)

Initial Displacement: 4.759 ft
Wellbore Radius: 0.458 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.167 ft
Well Skin Radius: 0.458 ft
Total Well Penetration Depth: 11.08 ft



54MW9 RISING HEAD

Data Set: P:\...\54MW9RISE.aqt
Date: 06/19/07 Time: 16:34:57

PROJECT INFORMATION

Company: URS Group
Client: RFAAP
Project: 21355035
Test Location: Radford, VA
Test Well: 54MW9
Test Date: March 2, 2005

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

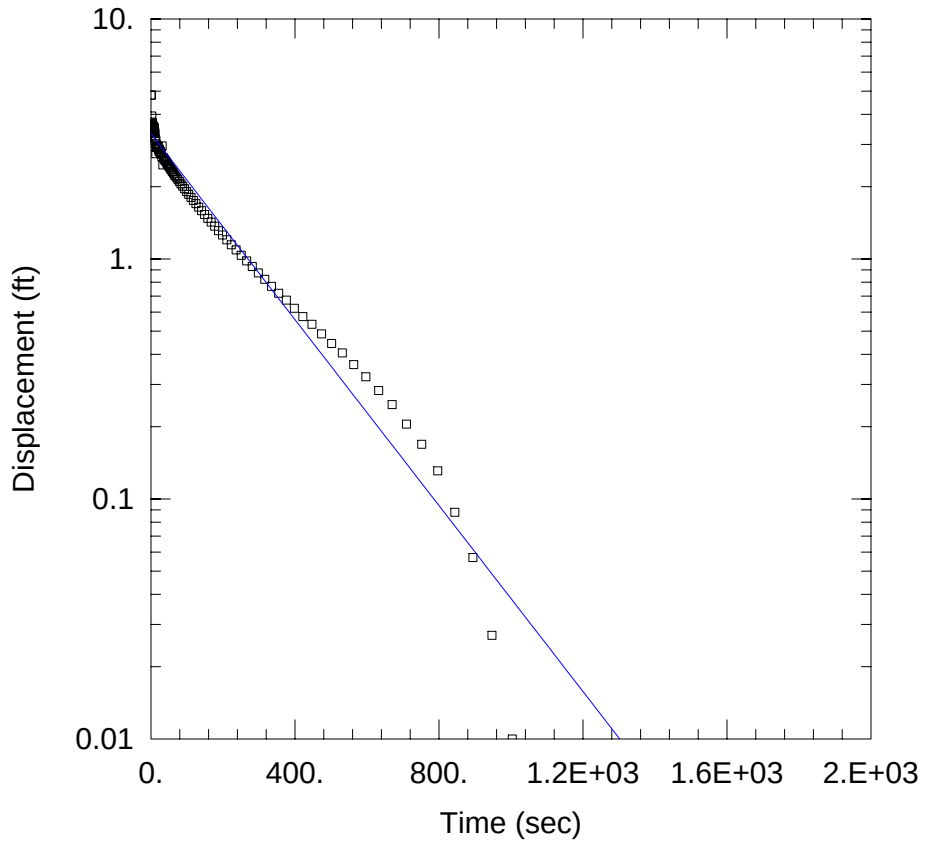
K = 0.0003089 cm/sec
y0 = 4.399 ft

AQUIFER DATA

Saturated Thickness: 27.95 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (54MW9)

Initial Displacement: 4.375 ft
Wellbore Radius: 0.458 ft
Screen Length: 10. ft
Gravel Pack Porosity: 0.3
Casing Radius: 0.167 ft
Well Skin Radius: 0.458 ft
Total Well Penetration Depth: 11.08 ft



54MW10 FALLING HEAD

Data Set: P:\...\54MW10FALL.aqt
Date: 06/19/07 Time: 16:31:23

PROJECT INFORMATION

Company: URS Group
Client: RFAAP
Project: 21355035
Test Location: Radford, VA
Test Well: 54MW10
Test Date: March 2, 2005

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0002929 cm/sec
y0 = 3.325 ft

AQUIFER DATA

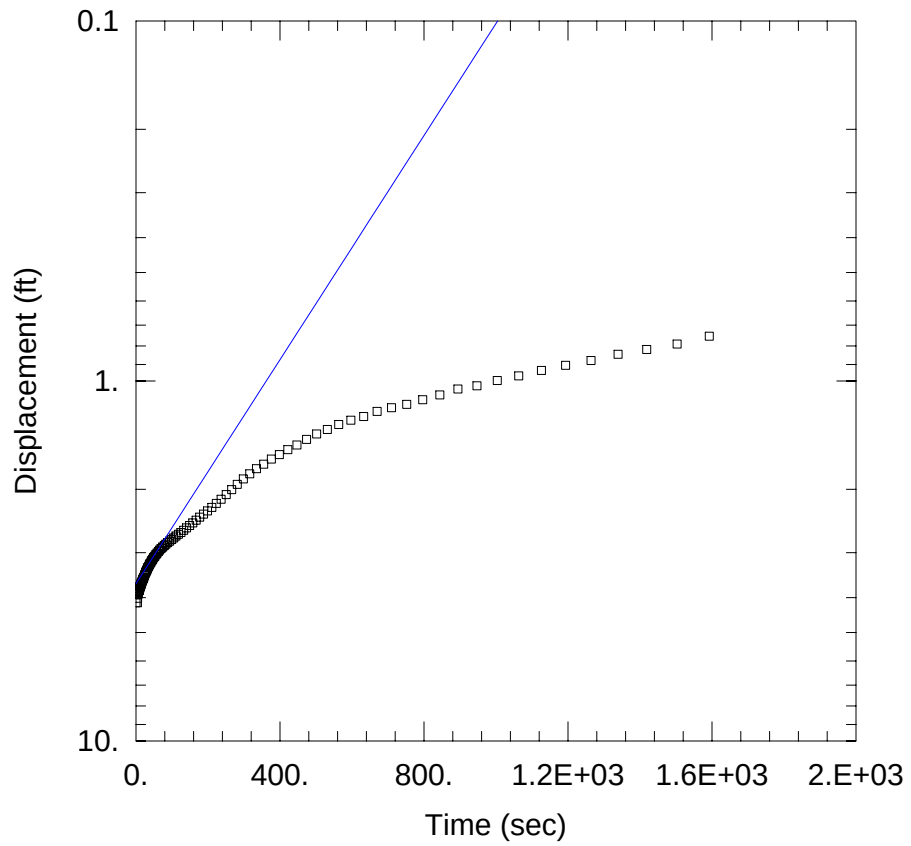
Saturated Thickness: 31.21 ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (54MW10)

Initial Displacement: 4.812 ft
Wellbore Radius: 0.458 ft
Screen Length: 15. ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.167 ft
Well Skin Radius: 0.458 ft
Total Well Penetration Depth: 15.9 ft



54MW10 RISING HEAD

Data Set: P:\...\54MW10RISE.aqt
Date: 06/19/07 Time: 16:35:22

PROJECT INFORMATION

Company: URS Group
Client: RFAAP
Project: 21355035
Test Location: Radford, VA
Test Well: 54MW10
Test Date: March 2, 2005

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0002355 cm/sec
y0 = 3.658 ft

AQUIFER DATA

Saturated Thickness: 31.3 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (54MW10)

Initial Displacement: 4.131 ft
Wellbore Radius: 0.458 ft
Screen Length: 15. ft
Gravel Pack Porosity: 0.3

Casing Radius: 0.167 ft
Well Skin Radius: 0.458 ft
Total Well Penetration Depth: 15.99 ft

APPENDIX C.5

FIELD SAMPLING DATA SHEETS

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NEW RIVER SEDIMENT SAMPLING
November 2006

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Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	misting	Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter: _____

Conductivity Meter: _____ µs standard solution Turbidity Meter: _____

Coordinates

Coordinate System:	NGS 84 Lat. Long	Source:	Accuracy:
X-Coordinate	80° 33.119W	Y-Coordinate	37° 11.459 N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED-1 Sample Collection Time: 14:35

Sampling Device: Scoop Depth (top): 0-4"

Depth Interval:

Sample Containers/Preservatives

VOCs		(clear glass, 4°C)	Physical Analysis: X
SVOCs		(clear glass, 4°C)	
Pesticides		(clear glass, 4°C)	
Herbicides		(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

Sample ID: NR-SED-4 Sample Collection Time: 14:50

Sampling Device: Scoop Depth (top): 0-4"

Depth Interval:

Sample Containers/Preservatives

VOCs		(clear glass, 4°C)	Physical Analysis: X
SVOCs		(clear glass, 4°C)	
Pesticides		(clear glass, 4°C)	
Herbicides		(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

Coord - 80° 32.982W 37° 11.689N

Date Completed: 11/8/06

Signature of Samplers: CP

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:		Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Coordinates

Coordinate System:	WGS84 Lat Long	Source:	Accuracy:
X-Coordinate	80°32.393W	Y-Coordinate	37°11.615N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED-3 Sample Collection Time: 14:[illegible]05

Sampling Device: Scoop Depth (top): 0-4" Depth Interval:

Sample Containers/Preservatives

VOCs		(clear glass, 4°C)	Physical Analysis: X
SVOCs		(clear glass, 4°C)	
Pesticides		(clear glass, 4°C)	
Herbicides		(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: DUP-3 Photo No:
MS/MSD Samples Taken Here:

Sample Description:

Sample ID: NR-SED-2 Sample Collection Time: 14:25

Sampling Device: Scoop Depth (top): 0-4" Depth Interval:

Sample Containers/Preservatives

VOCs		(clear glass, 4°C)	Physical Analysis: X
SVOCs		(clear glass, 4°C)	
Pesticides		(clear glass, 4°C)	
Herbicides		(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample Description:
Coord - 80°32.862N 37°11.536N

Date Completed: 11/8/06

Signature of Samplers: CD

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	Sunny	Sampling Team:	CD/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter: _____

Conductivity Meter: _____ µs standard solution Turbidity Meter: _____

Coordinates

Coordinate System:	~~NR-SED-6~~	Source:	Accuracy:
X-Coordinate	80° 31.944 W	Y-Coordinate	37° 11.533 N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED-6 Sample Collection Time: 13:40

Sampling Device: Scoop Depth (top): 0-4"

Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

Sample ID: NR-SED-5 Sample Collection Time: 13:50

Sampling Device: Scoop Depth (top): 0-4"

Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

coord - 80° 32.127W 37° 11.608N

Date Completed: 11/8/06

Signature of Samplers: CD

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	Sunny	Sampling Team:	CD/DC

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter: _____

Conductivity Meter: _____ µs standard solution Turbidity Meter: _____

Coordinates

Coordinate System:	WGS84 lat. Long.	Source:	Accuracy:
X-Coordinate	80° 31.766W	Y-Coordinate	37° 11.567N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SD-7 Sample Collection Time: 1500

Sampling Device: Scoop Depth (top): 0-4"

Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: 5

MS/MSD Samples Taken Here: _____

Sample Description:

Sample ID: _____ Sample Collection Time: _____

Sampling Device: _____ Depth (top): _____

Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: _____
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	_____	(250 mL, plastic, 4°C)	
Explosives	_____	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

Date Completed: 11/8/06

Signature of Samplers: CP

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/18/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	sunny	Sampling Team:	CO/DC

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter: _____

Conductivity Meter: _____ µs standard solution Turbidity Meter: _____

Coordinates

Coordinate System:	WGS 84 Lat. long.	Source:	Accuracy:
X-Coordinate	80° 31.920W	Y-Coordinate	37° 11.533 N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED 9 Sample Collection Time: 13:05

Sampling Device: Scoop Depth (top): 0-4" Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: DUP-2 Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

Sample ID: NR-SED 8 Sample Collection Time: 13:25

Sampling Device: Scoop Depth (top): 0-4" Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: 4

MS/MSD Samples Taken Here: _____

Sample Description:
Coord - 80° 31.607 W 37° 11.438 N

Date Completed: 1/18/06

Signature of Samplers: CJD

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:		Sampling Team:	CD/DC

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter: _____

Conductivity Meter: _____ µs standard solution Turbidity Meter: _____

Coordinates

Coordinate System:	W65 84 Lat. Long.	Source:	Accuracy:
X-Coordinate	80° 31.230W	Y-Coordinate	37°11.565N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED-11 Sample Collection Time: 12:35

Sampling Device: Scoop Depth (top): 0-4" Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

Sample ID: NR-SED-10 Sample Collection Time: 12:50

Sampling Device: scoop Depth (top): 0-4" Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

coord - 80° 31.298W 37°11.553N

Date Completed: 11/8/06

Signature of Samplers: CP

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	sunny	Sampling Team:	CD / DC

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter: _____

Conductivity Meter: _____ µs standard solution Turbidity Meter: _____

Coordinates

Coordinate System:	WGS 84 lat. Long.	Source:	Accuracy:
X-Coordinate	80° 31.095W	Y-Coordinate	37° 11.648N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED-13 Sample Collection Time: 11:50

Sampling Device: Scoop Depth (top): 0-4"

Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

Sample ID: NR-SED-12 Sample Collection Time: ~~11:50~~ 12:00

Sampling Device: Scoop Depth (top): 0-4"

Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

~~Coord - 80° 30.949W 37° 11.567N~~ ~~SED~~

Coord - 80° 31.154W 37° 11.598 N

Date Completed: 11/8/06

Signature of Samplers: CP

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	sunny	Sampling Team:	CD/OC

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter: _____

Conductivity Meter: _____ µs standard solution Turbidity Meter: _____

Coordinates

Coordinate System:	WGS 84 lat Long	Source:	Accuracy:
X-Coordinate	80° 30.935	Y-Coordinate	37° 11.939
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED-15 Sample Collection Time: 11:00

Sampling Device: scoop Depth (top): 0-4" Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample Description:

Sample ID: NR-SED-14 Sample Collection Time: 11:25

Sampling Device: scoop Depth (top): 0-4" Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: X

Sample Description:

Coord - 80° 30.949W 37° 11.867N

Date Completed: 11/8/06

Signature of Samplers: CD

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy/rain	Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Coordinates

Coordinate System:	WGS84 lat long	Source:	Accuracy:
X-Coordinate	80°31.220W	Y-Coordinate	37°12.363N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED-17 Sample Collection Time: 10:35

Sampling Device: scoop Depth (top): 0-4" Depth Interval:

Sample Containers/Preservatives

VOCs	____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	____	(clear glass, 4°C)	
Pesticides	____	(clear glass, 4°C)	
Herbicides	____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: yes DUP-1 Photo No: ____
MS/MSD Samples Taken Here: ____

Sample Description:

Sample ID: NR-SED-16 Sample Collection Time: 10:50

Sampling Device: scoop Depth (top): 0-4" Depth Interval:

Sample Containers/Preservatives

VOCs	____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	____	(clear glass, 4°C)	
Pesticides	____	(clear glass, 4°C)	
Herbicides	____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____
MS/MSD Samples Taken Here: ____

Sample Description:
Coord - 80° 31.117 W 37° 12.366 N

Date Completed: 11/8/06

Signature of Samplers: CD

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy	Sampling Team:	CP & OC

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter: _____
Turbidity Meter: _____

Coordinates

Coordinate System:	WGS 84 Lat. long.	Source:	Accuracy:
X-Coordinate	80° 31.7cele W	Y-Coordinate	37° 12.373N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED-19 Sample Collection Time: 10:10

Sampling Device: Scoop Depth (top): 0-4"
Depth Interval: _____

Sample Containers/Preservatives

VOCs	____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	____	(clear glass, 4°C)	
Pesticides	____	(clear glass, 4°C)	
Herbicides	____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample Description:

Sample ID: NR-SED-18 Sample Collection Time: 10:20

Sampling Device: Scoop Depth (top): 0-4"
Depth Interval: _____

Sample Containers/Preservatives

VOCs	____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	____	(clear glass, 4°C)	
Pesticides	____	(clear glass, 4°C)	
Herbicides	____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample Description:
coord - 80°31.474W 37°12.389N

Date Completed: 11/8/06

Signature of Samplers: CP

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy/rain	Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter: _____
Turbidity Meter: _____

Coordinates

Coordinate System:	W GS84 lat long	Source:	Accuracy:
X-Coordinate	80° 33.818 W	Y-Coordinate	37° 11.977 N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED-21 Sample Collection Time: 9:25

Sampling Device: Scoop Depth (top): 0-4"
Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample Description:

Sample ID: NR-SED-20 Sample Collection Time: 9:50

Sampling Device: Scoop Depth (top): 0-4"
Depth Interval: _____

Sample Containers/Preservatives

VOCs	_____	(clear glass, 4°C)	Physical Analysis: X
SVOCs	_____	(clear glass, 4°C)	
Pesticides	_____	(clear glass, 4°C)	
Herbicides	_____	(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample Description:
coord - 80°32.042W 37°12.332N

Date Completed: 11/8/06

Signature of Samplers: CD

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/8/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy	Sampling Team:	CD/DC

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter: _____
Turbidity Meter: _____

Coordinates

Coordinate System:	WGS 84 Lat, Long.	Source:	Accuracy:
X-Coordinate	80° 34.090W	Y-Coordinate	37° 11.737N
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Sediment

Sample ID: NR-SED-22 Sample Collection Time: 8:25

Sampling Device: Scoop Depth (top): 0-4"
Depth Interval:

Sample Containers/Preservatives

VOCs		(clear glass, 4°C)	Physical Analysis: X
SVOCs		(clear glass, 4°C)	
Pesticides		(clear glass, 4°C)	
Herbicides		(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: 1
MS/MSD Samples Taken Here: _____

Sample Description:

Sample ID: NR-SED-23 Sample Collection Time: 9:05

Sampling Device: Scoop Depth (top): 0-4"
Depth Interval:

Sample Containers/Preservatives

VOCs		(clear glass, 4°C)	Physical Analysis: X
SVOCs		(clear glass, 4°C)	
Pesticides		(clear glass, 4°C)	
Herbicides		(clear glass, 4°C)	
Metals, Unfiltered	X	(250 mL, plastic, 4°C)	
Explosives	X	(clear glass, 4°C)	

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample Description:
coord - 80° 34.117W 37° 11.762N

Date Completed: 11/8/06

Signature of Samplers: CD

NEW RIVER SURFACE WATER AND PORE WATER SAMPLING
November/December 2006

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Project Information

Project Name:	SWMU 54 - RFI	Date:	11/30/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	Cloudy	Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter: _____

Conductivity Meter: _____ µs standard solution Turbidity Meter: _____

Coordinates

Coordinate System:	VA State Plane, VAS, NAD83 feet	Source:	Accuracy:
X-Coordinate	~~80° 30' 55.766" W~~ → 1089596 2.640	Y-Coordinate	~~37° 11' 58.294" N~~ 36 02479.094
Elevation Reference:		Source:	Accuracy:
Elevation:	511 m	Units:	

Surface Water

Sample ID: NR-SW-1 Sample Collection Time: 915

Sampling Device: peristaltic Depth Interval: 3" below water surface @ sed/sw interface

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No: _____

MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	8.90	Final Conductivity (µs):	0.116	Final Turbidity (NTU):	71.3
Final Temperature (°C):	10.1	Final DO (mg/L):	17.05	Final ORP:	219
				Date Completed:	

Pore Water

Sample ID: NR-PW-1 Sample Collection Time: 916

Sampling Device: peristaltic Depth Interval: 24" probe inserted to refusal

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Perchorate	X	(250 ml, plastic, 4°C)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No: _____

MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.33	Final Conductivity (µs):	0.307	Final Turbidity (NTU):	16.35
Final Temperature (°C):	12.8	Final DO (mg/L):	16.38	Final ORP:	-109
				Date Completed:	11/30/06

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/30/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy	Sampling Team:	DC/BD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Coordinates

Coordinate System:	VA State Plane, VAS, NAD83, feet	Source:	Accuracy:
X-Coordinate	10895952.300	Y-Coordinate	36023856.333
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Surface Water

Sample ID: NR-SW-2 Sample Collection Time: 10:30

Sampling Device: peristaltic Depth Interval: 3"

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Other	X	(perchlorate)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No: _____
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	8.10	Final Conductivity (µs):	0.113	Final Turbidity (NTU):	~~12.7~~ 13.7
Final Temperature (°C):	9.9	Final DO (mg/L):	15.83	Final ORP:	118
				Date Completed:	11/30/06

Pore Water

Sample ID: NR-PW-2 Sample Collection Time: 11:10

Sampling Device: peristaltic Depth Interval: 6"

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Perchorate	X	(250 ml, plastic, 4°C)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No: _____
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.21	Final Conductivity (µs):	0.344	Final Turbidity (NTU):	97.9
Final Temperature (°C):	10.7	Final DO (mg/L):	10.46	Final ORP:	-174
				Date Completed:	11/30/06

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/30/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy	Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Coordinates

Coordinate System:	VAStatePlane/VAS, NAD83, feet	Source:	Accuracy:
X-Coordinate	10895951.582	Y-Coordinate	3602306.527
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Surface Water

Sample ID: NR-SW-3
Sample Collection Time: 11:20 11:25
Sampling Device: peristaltic
Depth Interval: 3"

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Other	X	(perchlorate)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no
Photo No:
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.96	Final Conductivity (µs):	0.118	Final Turbidity (NTU):	17.48
Final Temperature (°C):	10.1	Final DO (mg/L):	14.64	Final ORP:	47
				Date Completed:	11/30/06

Pore Water

Sample ID: NR-PW-3
Sample Collection Time: 11:55
Sampling Device: peristaltic
Depth Interval: 6"

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Perchorate	X	(250 ml, plastic, 4°C)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no
Photo No:
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.47	Final Conductivity (µs):	0.248	Final Turbidity (NTU):	22.7
Final Temperature (°C):	10.9	Final DO (mg/L):	12.2	Final ORP:	20
				Date Completed:	11/30/06

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/30/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	Cloudy	Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Coordinates

Coordinate System:	VA Stateplane VAS, NAD83, feet	Source:	Accuracy:
X-Coordinate	10895238.452	Y-Coordinate	3602252.251
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Surface Water

Sample ID: NR-SW-4 Sample Collection Time: 12:10

Sampling Device: peristaltic Depth Interval: 3"

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No:
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.81	Final Conductivity (µs):	0.179	Final Turbidity (NTU):	9.94
Final Temperature (°C):	10.3	Final DO (mg/L):	12.93	Final ORP:	53
				Date Completed:	

Pore Water

Sample ID: NR-PW-4 Sample Collection Time: 12:20

Sampling Device: peristaltic Depth Interval: 6"

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Perchorate	X	(250 ml, plastic, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No:
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.57	Final Conductivity (µs):	0.380	Final Turbidity (NTU):	4.86
Final Temperature (°C):	10.6	Final DO (mg/L):	9.35	Final ORP:	-182
				Date Completed:	11/30/06

Project Information

Project Name:	SWMU 54 - RFI	Date:	11/30/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy	Sampling Team:	CP/DC

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter: _____
Turbidity Meter: _____

Coordinates

Coordinate System:	VA State Plane, VAS, NAD83, feet	Source:	Accuracy:
X-Coordinate	~~80° 30' 56.065"~~ → 10895935.085	Y-Coordinate	~~37° 11' 55.602"~~ 36022207.388
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Surface Water

Sample ID: NL-SW-5
Sample Collection Time: 12:40
Sampling Device: peristaltic
Depth Interval: 6"

Sample Containers/Preservatives

VOCs	____	(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	____	
SVOCs	____	(1 liter, amber glass, 4°C)	TOX	____	
Pesticides	____	(1 liter, amber glass, 4°C)	Other	X	(perchlorate)
Herbicides	____	(1 liter, amber glass, 4°C)	Other	____	( )
Metals, Unfiltered	____	(1 liter, plastic HNO_3, pH<2, 4°C)	Other	____	( )
Metals, Filtered	____	(1 liter, plastic HNO_3, pH<2, 4°C)	Other	____	( )
Explosives	X	(1 liter, amber glass, 4°C)	Other	____	( )

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: no
MS/MSD Samples Taken Here: yes
Photo No: _____

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.67	Final Conductivity (µs):	0.117	Final Turbidity (NTU):	7.66
Final Temperature (°C):	10.2	Final DO (mg/L):	14.83	Final ORP:	32
				Date Completed:	

Pore Water

Sample ID: NL-PW-5
Sample Collection Time: 13:05
Sampling Device: peristaltic
Depth Interval: 6"

Sample Containers/Preservatives

VOCs	____	(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	____	
SVOCs	____	(1 liter, amber glass, 4°C)	TOX	____	
Pesticides	____	(1 liter, amber glass, 4°C)	Perchorate	X	(250 ml, plastic, 4°C)
Herbicides	____	(1 liter, amber glass, 4°C)	Other	____	( )
Metals, Unfiltered	____	(1 liter, plastic HNO_3, pH<2, 4°C)	Other	____	( )
Metals, Filtered	____	(1 liter, plastic HNO_3, pH<2, 4°C)	Other	____	( )
Explosives	X	(1 liter, amber glass, 4°C)	Other	____	( )

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: no
MS/MSD Samples Taken Here: no
Photo No: _____

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.41	Final Conductivity (µs):	0583	Final Turbidity (NTU):	3.63
Final Temperature (°C):	13.2	Final DO (mg/L):	1682	Final ORP:	-44
				Date Completed:	11/30/06

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Project Information

Project Name:	SWMU 54 - RFI	Date:	11/30/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy	Sampling Team:	CD/IK

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter: _____

Conductivity Meter: _____ µs standard solution Turbidity Meter: _____

Coordinates

Coordinate System:	VA State Plane, VAS, NAD83, feet	Source:	Accuracy:
X-Coordinate	~~2003056.085~~	Y-Coordinate	~~37° 11' 55.071"~~ 3602150.092
Elevation Reference:	→ 10895934.649	Source:	Accuracy:
Elevation:		Units:	

Surface Water

Sample ID: NR-SW-6 Sample Collection Time: 13:30

Sampling Device: peristaltic Depth Interval: 6"

Sample Containers/Preservatives

VOCs	_____	(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____	(1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____	(1 liter, amber glass, 4°C)	Other	X	(perchlorate)
Herbicides	_____	(1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____	(1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____	(1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X	(1 liter, amber glass, 4°C)	Other	_____	( )

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	8.3	Final Conductivity (µs):	0.155	Final Turbidity (NTU):	6.21
Final Temperature (°C):	10.4	Final DO (mg/L):	15.11	Final ORP:	35
				Date Completed:	

Pore Water

Sample ID: NR-PW-6 Sample Collection Time: 13:40

Sampling Device: peristaltic Depth Interval: 6"

Sample Containers/Preservatives

VOCs	_____	(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____	(1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____	(1 liter, amber glass, 4°C)	Perchorate	X	(250 ml, plastic, 4°C)
Herbicides	_____	(1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____	(1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____	(1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X	(1 liter, amber glass, 4°C)	Other	_____	( )

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: DUP-3 Photo No: _____

MS/MSD Samples Taken Here: NO

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.2	Final Conductivity (µs):	0.353	Final Turbidity (NTU):	~~11.85~~
Final Temperature (°C):	11.9	Final DO (mg/L):	11.34	Final ORP:	-58
				Date Completed:	11/30/06

Project Information

Project Name:	SWMU 54 - RFI	Date:	12/1/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy	Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Coordinates

Coordinate System:	VA stateplane, VAS, NAD83, feet	Source:	Accuracy:
X-Coordinate	1089516.634	Y-Coordinate	3602051.153
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Surface Water

Sample ID: NR-SW-7
Sample Collection Time: 7:50
Sampling Device: peristaltic
Depth Interval: ~~0~~ 2"

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Other	X	(peristaltic)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no
MS/MSD Samples Taken Here: no
Photo No: _____

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	8.11	Final Conductivity (µs):	0.140	Final Turbidity (NTU):	148
Final Temperature (°C):	11.7	Final DO (mg/L):	13.13	Final ORP:	10
				Date Completed:	

Pore Water

Sample ID: NR-PW-7
Sample Collection Time: 8:15
Sampling Device: peristaltic
Depth Interval: 6"

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Perchorate	X	(250 ml, plastic, 4°C)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no
MS/MSD Samples Taken Here: no
Photo No: _____

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.54	Final Conductivity (µs):	0.517	Final Turbidity (NTU):	3.72
Final Temperature (°C):	13	Final DO (mg/L):	9.25	Final ORP:	-194
				Date Completed:	12/1/06

Project Information

Project Name:	SWMU 54 - RFI	Date:	12/1/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy	Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Coordinates

Coordinate System:	VA stateplane, VAS, NAD83, feet	Source:	Accuracy:
X-Coordinate	10895903.777	Y-Coordinate	3602024.710
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Surface Water

Sample ID: NR-SW-8 Sample Collection Time: 8:35

Sampling Device: peristaltic Depth Interval: 2"

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Other	X	(perchlorate)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: DUP-4 Photo No: _____
MS/MSD Samples Taken Here: _____

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.80	Final Conductivity (µs):	0.124	Final Turbidity (NTU):	13.3
Final Temperature (°C):	12.5	Final DO (mg/L):	13.27	Final ORP:	41
				Date Completed:	

Pore Water

Sample ID: NR-PW-8 Sample Collection Time: 9:00

Sampling Device: peristaltic Depth Interval: 6"

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Perchorate	X	(250 ml, plastic, 4°C)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No: _____
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.36	Final Conductivity (µs):	0.660	Final Turbidity (NTU):	5.60
Final Temperature (°C):	12.9	Final DO (mg/L):	9.74	Final ORP:	-173
				Date Completed:	12/1/06

Project Information

Project Name:	SWMU 54 - RFI	Date:	12/1/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy	Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter: _____

Conductivity Meter: _____ µs standard solution Turbidity Meter: _____

Coordinates

Coordinate System:	VA stateplane, VAS, NAD83, feet	Source:	Accuracy:
X-Coordinate	10895893.01	Y-Coordinate	36019 32.491
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Surface Water

Sample ID: NR - SW-9 Sample Collection Time: 9:20

Sampling Device: peristaltic Depth Interval: 3"

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Other	X	(perchlorate)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No: _____

MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.62	Final Conductivity (µs):	0.131	Final Turbidity (NTU):	20.5
Final Temperature (°C):	11.8	Final DO (mg/L):	13.76	Final ORP:	51
				Date Completed:	

Pore Water

Sample ID: NR-PW-9 Sample Collection Time: 9:35

Sampling Device: NR-SW-9 peristaltic Depth Interval: 10"

Sample Containers/Preservatives

VOCs	_____ (40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	_____	
SVOCs	_____ (1 liter, amber glass, 4°C)	TOX	_____	
Pesticides	_____ (1 liter, amber glass, 4°C)	Perchorate	X	(250 ml, plastic, 4°C)
Herbicides	_____ (1 liter, amber glass, 4°C)	Other	_____	( )
Metals, Unfiltered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Metals, Filtered	_____ (1 liter, plastic HNO_3, pH<2, 4°C)	Other	_____	( )
Explosives	X (1 liter, amber glass, 4°C)	Other	_____	( )

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No: _____

MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.23	Final Conductivity (µs):	0.533	Final Turbidity (NTU):	15.87
Final Temperature (°C):	13.2	Final DO (mg/L):	10.55	Final ORP:	-173
				Date Completed:	12/1/06

Project Information

Project Name:	SWMU 54 - RFI	Date:	12/1/06
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30002	Sampling Event:	Surface Water / Sediment Sampling
Weather Conditions:	cloudy	Sampling Team:	DC/CD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Coordinates

Coordinate System:	VA state plane, VAs, NAD83, feet	Source:	Accuracy:
X-Coordinate	10895849.735	Y-Coordinate	3601828.442
Elevation Reference:		Source:	Accuracy:
Elevation:		Units:	

Surface Water

Sample ID: NR-SW-10 Sample Collection Time: 10:00

Sampling Device: peristaltic Depth Interval: 3"

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	x	(perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Explosives	x	(1 liter, amber glass, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No:
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.83	Final Conductivity (µs):	0.114	Final Turbidity (NTU):	11.46
Final Temperature (°C):	11	Final DO (mg/L):	14.69	Final ORP:	52
				Date Completed:	

Pore Water

Sample ID: NR-PW-10 Sample Collection Time: 10:15

Sampling Device: peristaltic Depth Interval: 6"

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Perchorate	x	(250 ml, plastic, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Explosives	x	(1 liter, amber glass, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no Photo No:
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.47	Final Conductivity (µs):	0.479	Final Turbidity (NTU):	1.66
Final Temperature (°C):	13.1	Final DO (mg/L):	10.18	Final ORP:	-157
				Date Completed:	12/1/06

1st QUARTER GROUNDWATER SAMPLING
November/December 2006

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Project Information

Monitoring Well ID: 54MW1
Depth to Water: 18.15'
Total Well Depth:

Project Name: SWMU 4 Add'l Invest
Facility Name: RFAAP
URS Project No.: 11656351
Weather Conditions: cloudy
Date: 12/29/06
Client: RFAAP
Sampling Event:
Sampling Team: DC/CD

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [X]
Peristaltic Pump: [ ]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
13:33	250 ml/min	--	clear	8.32	14.4	0.437	18.12	13.20	265
13:38	250 ml/min	1.25 L	clear	7.89	14.3	0.441	13.45	29.0	193
13:43	250 ml/min	1.25 L	clear	7.84	14.8	0.440	13.04	8.104	180
13:48	250 ml/min	1.25 L	clear	7.83	15.2	0.439	12.36	5.09	168
13:53	250 ml/min	1.25 L	clear	7.86	15.6	0.440	11.95	4.47	153

Sampling Data

Monitoring Well ID: 54MW1
Sample Collection Time: 13:55

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump: X
Peristaltic Pump:
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides/PCBs	X	(1 liter, amber glass, 4°C)	Other	~~X~~	(~~PCBs~~)
Herbicides		(1 liter, amber glass, 4°C)	Other	X	(perchlorate)
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other	X	(dioxin/furans)
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no
MS/MSD Samples Taken Here: no
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No
Final pH (SU):
Final Temperature (°C):
Final Conductivity (µs):
Final DO:
Final Turbidity (NTU):
Final ORP:
Date Completed:

Well Locked At:
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW2 — Depth to Water: 21.73'
Total Well Depth:

Project Name: SWMU 54 Add'l Invest — Date: 7/29/06
Facility Name: KEAAP — Client: KEAAP
URS Project No.: 11650351 — Sampling Event:
Weather Conditions: cloudy — Sampling Team: DC/CD

Purge Equipment

Dedicated Bladder Pump: [ ] — Peristaltic Pump: [ ]
Dedicated Submersible Pump: [ ] — Dedicated Bailer: [ ]
Submersible Pump: [X] Minitrol Serial # 18469 — Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 — DO Meter:
Conductivity Meter: _____ µs standard solution — Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
14:36	250 ml/min	~ —	clear	8.26	15.2	0.571	15.14	15.15	237
14:41	250ml/min	1.25L	clear	7.38	16.0	0.574	12.10	6.12	159
14:46	250ml/min	1.25L	clear	7.29	17.1	0.556	10.47	3.04	144
14:51	250ml/min	1.25L	clear	7.19	17.6	0.537	10.27	1.48	153
14:56	250ml/min	1.25	clear	7.15	17.7	0.533	10.29	1.16	159

Sampling Data

Monitoring Well ID: 54MW2 — Sample Collection Time: 15:05

Sampling Device:
Dedicated Bladder Pump: — Peristaltic Pump:
Dedicated Submersible Pump: — Dedicated Bailer:
Submersible Pump: X — Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC			
SVOCs		(1 liter, amber glass, 4°C)	TOX			
Pesticides / PCBs	X	(1 liter, amber glass, 4°C)	Other	X	(Perchlorate	)
Herbicides		(1 liter, amber glass, 4°C)	Other	X	(Dioxin/furans	)
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		(	)
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		(	)
PAHs		(1 liter, amber glass, 4°C)	Other		(	)
Explosives	X	(1 liter, amber glass, 4°C)	Other		(	)
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		(	)

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no — Photo No:
MS/MSD Samples Taken Here: yes

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU): — Final Conductivity (µs): — Final Turbidity (NTU):
Final Temperature (°C): — Final DO: — Final ORP:
Date Completed:

Well Locked At: 15:23 — Signature of Samplers: CW DC
no lock there weekend + caribbean

Project Information

Monitoring Well ID: 54MW3
Depth to Water: 23.14
Total Well Depth:
Project Name: SWMU 54 - Add'l Invest
Date: 12/5/06
Facility Name: RFAAP
Client: RFAAP
URS Project No.: 11656351
Sampling Event:
Weather Conditions: Sunny
Sampling Team: CDI DC

Purge Equipment

Dedicated Bladder Pump:	[ ]	Peristaltic Pump:	[ ]
Dedicated Submersible Pump:	[ ]	Dedicated Bailer:	[ ]
Submersible Pump:	[X]	Disposable Bailer:	[ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
DO Meter:
Conductivity Meter: _____ µs standard solution
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
12:12	250 mL/min	—	clear	8.16	12.9	0.591	16.29	5.43	216
12:17	250 mL/min	1.25 L	clear	7.52	~~13.73~~ 14.8	0.685	10.73	4.37	124
12:22	250 mL/min	1.25 L	clear	7.47	15.3	0.685	10.59	2.53	125
12:27	250 mL/min	1.25 L	clear	7.31	14.9	0.577	11.93	0.27	161
12:32	250 mL/min	1.25	clear	7.26	~~14.94~~ 15.3	0.580	11.94	0.07	171
		5 L Total							

Sampling Data

Monitoring Well ID: 54MW3
Sample Collection Time: 12:40

Sampling Device:

Dedicated Bladder Pump:		Peristaltic Pump:	
Dedicated Submersible Pump:		Dedicated Bailer:	
Submersible Pump:		Disposable Bailer:	

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides /PCBs	X	(1 liter, amber glass, 4°C)	Other	X	(Diisopropyl methylphosphonate)
Herbicides		(1 liter, amber glass, 4°C)	Other	X	(perchlorate)
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: DUP-5
Photo No:
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):		Final Conductivity (µs):		Final Turbidity (NTU):	
Final Temperature (°C):		Final DO:		Final ORP:	
				Date Completed:	

Well Locked At: 1:10
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW4
Depth to Water: 15.99'
Total Well Depth:

Project Name: SWMU 54 Add'l Invest
Facility Name: RFAAP
URS Project No.: 11656351
Weather Conditions: cloudy
Date: 11/30/06
Client: RFAAP
Sampling Event:
Sampling Team: CO/DC

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [X]
Peristaltic Pump: [ ]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
15:35	250ml/min	–	clear	7.92	15.4	0.1010	10.39	7.91	-107
15:40	250ml/min	1.25 L	clear	7.91	14.0	0.989	9.3	9.16	-108
15:45	250ml/min	1.25 L	clear	7.82	14.2	1.11	10.62	9.36	-95
15:50	250ml/min	1.25 L	clear	7.78	14.8	1.13	10.16	3.89	-90
15:55	250ml/min	1.25 L	clear	7.77	15.0	1.13	9.9	2.166	-92

Sampling Data

Monitoring Well ID: 54MW4
Sample Collection Time: 1600

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump: X
Peristaltic Pump:
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides/PCBs	X	(1 liter, amber glass, 4°C)	Other	X	(Dioxin Furans)
Herbicides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no
MS/MSD Samples Taken Here: no
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):
Final Temperature (°C):
Final Conductivity (µs):
Final DO:
Final Turbidity (NTU):
Final ORP:
Date Completed:

Well Locked At: 16:15
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW05
Depth to Water: 18.09'
Total Well Depth:

Project Name: SWMU54 Add'l Invest
Facility Name: RFAAP
URS Project No.: ~~46500281~~ 46563.351
Weather Conditions: ~~S~~unny
Date: 11/29/06
Client: RFAAP
Sampling Event:
Sampling Team: CO/DC

Purge Equipment

Dedicated Bladder Pump:	[ ]	Peristaltic Pump:	[ ]
Dedicated Submersible Pump:	[ ]	Dedicated Bailer:	[ ]
Submersible Pump:	[X]	Disposable Bailer:	[ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
15:40	250ml/min	--	clear	7.28	16.4	0.499	15.69	75.9	269
15:45	250ml/min	1.25L	clear	7.05	15.3	0.527	14.26	62.5	263
15:50	250ml/min	1.25L	clear	6.98	16.4	0.538	12.51	55.3	249
15:55	250ml/min	1.25L	clear	7.01	16.8	0.545	11.96	44.3	244
16:00	250ml/min	1.25L	clear	7.05	16.9	0.547	11.70	48.8	251
16:05	250ml/min	1.25L	clear	7.08	17.2	0.548	11.43	46.7	253
16:10	250ml/min	1.25L	clear	7.11	17.5	0.550	11.17	34.5	252
16:15	250ml/min	1.25L	clear	7.13	17.6	0.551	11.01	28.9	253
16:20	250ml/min	1.25L	clear	7.15	17.16	0.552	10.94	24.4	252
16:25	250ml/min	1.25L	clear	7.16	17.3	0.554	10.96	20.1	249
16:30	250ml/min	1.25L	clear	7.17	17.0	0.555	10.93	20.2	248
16:35	250ml/min	1.25L	clear	7.18	16.5	0.558	10.97	18.06	250
16:40	250ml/min	1.25L	clear	7.18	16.3	0.557	10.98	17.12	250
16:45	250ml/min	1.25L	clear	7.19	16.1	0.557	10.94	14.77	247
16:50	250ml/min	1.25L	clear	7.18	18.5	0.552	9.99	13.87	220
16:55	250ml/min	1.25L	clear	7.20	18.7	0.554	10.01	12.36	231
17:00	250ml/min	1.25L	clear	7.20	18.5	0.557	10.10	16.6	231

Sampling Data

Monitoring Well ID: 54MW5
Sample Collection Time: 17:05

Sampling Device:

Dedicated Bladder Pump:		Peristaltic Pump:	
Dedicated Submersible Pump:		Dedicated Bailer:	
Submersible Pump:	X	Disposable Bailer:	

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides/PCBs	X	(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no
MS/MSD Samples Taken Here: no
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):		Final Conductivity (µs):		Final Turbidity (NTU):	
Final Temperature (°C):		Final DO:		Final ORP:	
				Date Completed:	

Well Locked At: 5:30
Signature of Samplers: CO/DC

Project Information

Monitoring Well ID: 54MW6 — Depth to Water: 39.30'
Total Well Depth:

Project Name: SWMU54/55/80 Add'l Invest — Date: 11/29/06
Facility Name: RPAAP — Client: RPAAP
URS Project No.: 11651623 11656351 — Sampling Event: 5
Weather Conditions: cloudy — Sampling Team: DC/CD

Purge Equipment

Dedicated Bladder Pump:	[ ]	Peristaltic Pump:	[ ]
Dedicated Submersible Pump:	[ ]	Dedicated Bailer:	[ ]
Submersible Pump:	[X]	Disposable Bailer:	[ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 — DO Meter:
Conductivity Meter: _____ µs standard solution — Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
10:30	250 ml/min	~~	clear	8.28	12.7	0.304	14.9	10.62	254
10:35	250 ml/min	1.25L	clear	8.06	12.6	0.304	14.27	9.32	244
10:40	250 ml/min	1.25L	clear	7.85	14.2	0.303	12.46	7.10	202
10:45	250 ml/min	1.25L	clear	7.85	15.4	0.302	11.85	5.91	191
10:50	250 ml/min	1.25L	clear	7.88	16.3	0.300	11.59	4.75	184
10:55	250 ml/min	1.25L	clear	8.00	16.6	0.297	11.63	4.87	181

Sampling Data

Monitoring Well ID: 54MW6 — Sample Collection Time: 11:00

Sampling Device:

Dedicated Bladder Pump:		Peristaltic Pump:	
Dedicated Submersible Pump:		Dedicated Bailer:	
Submersible Pump:	X	Disposable Bailer:	

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides / PCBs	X	(1 liter, amber glass, 4°C)	Other	X	(PCBs)
Herbicides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other	X	(Dioxin/Furans)
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no — Photo No:
MS/MSD Samples Taken Here: no

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU): — Final Conductivity (µs): — Final Turbidity (NTU):
Final Temperature (°C): — Final DO: — Final ORP:
Date Completed:

Well Locked At: 11:15 — Signature of Samplers: CD / DC

Project Information

Monitoring Well ID: 54MW7
Depth to Water: 16.41'
Total Well Depth:
Project Name: BGMW54 Add'l Invest
Facility Name: LEAP
URS Project No.: 11056351
Weather Conditions: sunny
Date: 12/5/06
Client: LEAP
Sampling Event:
Sampling Team: CB/DC

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [X]
Peristaltic Pump: [ ]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
11:22	250 ml/min	—	clear	8.12	11.3	0.704	15.30	16.70	256
11:27	250 ml/min	1.25 L	clear	7.73	12.9	0.723	12.08	29.5	226
11:32	250 ml/min	1.25 L	clear	7.69	15.2	0.706	11.24	24.2	193
11:37	250 ml/min	1.25 L	clear	7.58	15.6	0.736	10.74	9.09	178
11:42	300 ml/min	1.25 L	clear	7.56	15.4	0.724	10.46	5.91	176
	Total	5L							

Sampling Data

Monitoring Well ID: 54MW7
Sample Collection Time: 11:50

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump: X
Peristaltic Pump:
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides/PCBs	X	(1 liter, amber glass, 4°C)	Other	X	(Dioxin Furans)
Herbicides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: NO
MS/MSD Samples Taken Here: NO
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):
Final Temperature (°C):
Final Conductivity (µs):
Final DO:
Final Turbidity (NTU):
Final ORP:
Date Completed:

Well Locked At: 12:00
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW8
Depth to Water: 13.66'
Total Well Depth:

Project Name: SMWU 54 Add'l Invest
Facility Name: RFAAP
URS Project No.: 11656351
Weather Conditions: sunny
Date: 12/1/06
Client: RFAAP
Sampling Event:
Sampling Team: CO/OC

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [X]
Peristaltic Pump: [ ]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250 milliliters per minute [X]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
13:50	250ml/min	--	cloudy	7.80	16.7	0.546	11.64	70.1	130
13:55	250ml/min	1.25L	cloudy	7.53	17.0	0.578	9.89	56.6	63
1400	250ml/min	2.50L	cloudy	7.51	17.4	0.592	9.30	62.1	15
1405		3.75	cloudy	7.52	17.4	0.594	9.16	56.7	13
1410		5.00	clear	7.52	17.5	0.594	9.06	35.0	18
1415		6.25	clear	7.51	17.3	0.599	9.07	22.6	25
1420		7.50	clear	7.52	17.5	0.599	8.92	14.86	29
1425		8.75	clear	7.53	17.5	0.603	8.90	12.82	29
1430		10.00	clear	7.54	17.2	0.606	8.98	10.68	31
1435		12.25	clear	7.53	17.1	0.605	8.94	11.83	32

Sampling Data

Monitoring Well ID: 54MW8
Sample Collection Time: 1440

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump: X
Peristaltic Pump:
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides/PCBs	X	(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: No
MS/MSD Samples Taken Here: No
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):
Final Temperature (°C):
Final Conductivity (µs):
Final DO:
Final Turbidity (NTU):
Final ORP:
Date Completed:

Well Locked At: 14:50
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW9
Depth to Water: 18.43
Total Well Depth:

Project Name: SWMU 54 add'l invest
Facility Name: RFAAP
URS Project No.: 11685351
Weather Conditions: sunny
Date: 12/1/06
Client: RFAAP
Sampling Event:
Sampling Team: CDY DC

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [X]
Peristaltic Pump: [ ]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
12:00	250ml/min	- -	clear	7.89	17.7	0.744	13.00	67.8	104
12:05	250ml/min	1.25 L	clear	7.74	16.9	0.770	10.83	44.3	72
12:10	250ml/min	1.25 L	clear	7.7	17.2	0.787	9.95	54.7	57
12:15	250ml/min	1.25L	clear	7.7	18.7	0.787	9.31	51.8	46
12:20	250ml/min	1.25L	clear	7.69	19.1	0.790	9.10	44.9	44
12:25	250ml/min	1.25L	clear	7.68	19.3	0.794	9.01	44.1	45
12:30	250ml/min	1.25L	clear	7.68	19.6	0.798	8.89	44.9	45
12:35	250ml/min	1.25L	clear	7.67	19.8	0.799	8.79	44.4	44
12:40	250ml/min	1.25L	clear	7.67	19.9	0.799	8.70	39.2	42
12:45	250ml/min	1.25L	clear	7.67	19.9	0.798	8.609	35.2	40
12:50	250ml/min	1.25L	clear	7.67	20.0	0.796	8.54	31.8	40
12:55	250ml/min	1.25L	clear	7.67	20.4	0.795	8.40	29.5	40
13:00	250ml/min	1.25L	clear	7.67	20.2	0.796	8.46	28.9	39
13:05	250ml/min	1.25L	clear	7.669	19.16	0.797	8.61	25.2	46
13:10	250ml/min	1.25L	clear	7.665	19.5	0.790	8.52	26.5	51
13:15	250ml/min	1.25L	clear	7.65	19.1	0.790	8.51	23.5	53

Sampling Data

Monitoring Well ID: 54MW9
Sample Collection Time: 13:20

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump: X
Peristaltic Pump:
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides / PCBs	X	(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: no
MS/MSD Samples Taken Here: no
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):
Final Temperature (°C):
Final Conductivity (µs):
Final DO:
Final Turbidity (NTU):
Final ORP:
Date Completed:

Well Locked At: 13:30
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW10
Depth to Water: 16.07'
Total Well Depth:

Project Name: SWMU54 - Add'l Invest
Facility Name: RFAAP
URS Project No.: 11656351
Weather Conditions: sunny
Date: 12/1/06
Client: RFAAP
Sampling Event:
Sampling Team: SS/DC

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [X]
Peristaltic Pump: [ ]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
15:02	250ml/min	--	clear	7.68	15.2	0.791	9.96	84.0	-11
15:07	250ml/min	1.25L	clear	7.61	15.7	0.794	8.68	74.6	-22
15:12	250ml/min	2.50L	clear	7.60	16.2	0.800	8.17	44.7	-28
15:17	250ml/min	3.75	clear	7.59	16.2	0.794	7.99	26.5	-29
15:22	250ml/min	5.0L	clear	7.57	16.2	0.787	7.91	19.26	-18
15:27	250ml/min	6.25L	clear	7.53	16.2	0.777	7.91	16.93	-8
15:32	250ml/min	7.50L	clear	7.57	16.1	0.786	7.93	14.82	18
15:37	250ml/min	8.75L	clear	7.43	15.8	0.742	8.28	16.01	216
15:42	250ml/min	10.0L		7.39	16.3	0.733	8.13	10.31	316

Sampling Data

Monitoring Well ID: 54MW10
Sample Collection Time: 15:50

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump: X
Peristaltic Pump:
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides/PCBs	X	(1 liter, amber glass, 4°C)	Other	X	(perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: NO
MS/MSD Samples Taken Here: NO
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):
Final Temperature (°C):
Final Conductivity (µs):
Final DO:
Final Turbidity (NTU):
Final ORP:
Date Completed:

Well Locked At: ~~14:05~~ 1600
Signature of Samplers:

SOIL ADDITIONAL INVESTIGATIONS
January 2007

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Project Information

Project Name:	SWMU 54 - RFI	Date:	1/10/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	partly cloudy, 27°F	Sampling Team:	JS/CF

Sample ID: 545B3A Sample Collection Time: 10:05

Sampling Device: direct push Depth (top): _____

Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives	✓		
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 545B3B Sample Collection Time: 10:10

Sampling Device: direct push Depth (top): _____

Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives	✓		
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 545B3C Sample Collection Time: 10:15

Sampling Device: direct push Depth (top): _____

Depth Interval: 13.3-14.3

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives	✓		
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 1/10/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/10/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	partly cloudy, 27°F	Sampling Team:	JS/CF

Sample ID: 54SB10A — Sample Collection Time: 10:51

Sampling Device: direct push — Depth (top): — Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB10B — Sample Collection Time: 10:57

Sampling Device: direct push — Depth (top): — Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB10C — Sample Collection Time: 11:04

Sampling Device: direct push — Depth (top): — Depth Interval: 13-14

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: DUP2 — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 1/10/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/11/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear, 30° F	Sampling Team:	JS/CF

Sample ID: 54SB22A — Sample Collection Time: 15:05

Sampling Device: direct push — Depth (top): — Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No: —

MS/MSD Samples Taken Here: MS/MSD Pest.

Sample ID: 54SB22B — Sample Collection Time: 15:10

Sampling Device: direct push — Depth (top): — Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No: —

MS/MSD Samples Taken Here: —

Sample ID: 54SB22C — Sample Collection Time: 15:15

Sampling Device: — Depth (top): — Depth Interval: 15-16

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No: —

MS/MSD Samples Taken Here: —

Signature of Samplers: [signature] — Date Completed: 1/12/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/17/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	raining, 30°F	Sampling Team:	JS/CF

Sample ID: 54SB23A Sample Collection Time: 9:18

Sampling Device: direct push Depth (top): ____

Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	✓	PID Reading:	____
Metals	____		
PCBs	✓		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB23B Sample Collection Time: 9:23

Sampling Device: direct push Depth (top): ____

Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	✓	PID Reading:	____
Metals	____		
PCBs	✓		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB23C Sample Collection Time: 9:28

Sampling Device: direct push Depth (top): ____

Depth Interval: 16-17

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	✓	PID Reading:	____
Metals	____		
PCBs	✓		
PCB congeners	____		
Explosives	✓		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/17/07

27

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/10/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	Partly cloudy, 27°F	Sampling Team:	JS/CF

Sample ID: 545B27A Sample Collection Time: 9:36

Sampling Device: direct push Depth (top): _____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans ✓ Physical Analysis: _____

Pesticides _____ PID Reading: _____

Metals _____

PCBs _____

PCB congeners _____

Explosives _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 545B27B Sample Collection Time: 9:41

Sampling Device: direct push Depth (top): _____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans ✓ Physical Analysis: _____

Pesticides _____ PID Reading: _____

Metals _____

PCBs _____

PCB congeners _____

Explosives _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 545B27C Sample Collection Time: 9:48

Sampling Device: direct push Depth (top): _____ Depth Interval: 14.3-15.3

Sample Containers/Preservatives

Dioxin/Furans ✓ Physical Analysis: _____

Pesticides _____ PID Reading: _____

Metals _____

PCBs _____

PCB congeners _____

Explosives _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 1/10/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/12/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	cloudy, 30° F	Sampling Team:	JS/CF

Sample ID: 54SB32C Sample Collection Time: 9:05

Sampling Device: direct push Depth (top): ____ Depth Interval: 16-17

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives	✓		

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: ____ Sample Collection Time: ____

Sampling Device: ____ Depth (top): ____ Depth Interval: ____

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: ____ Sample Collection Time: ____

Sampling Device: ____ Depth (top): ____ Depth Interval: ____

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/12/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/10/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear, 30°F	Sampling Team:	JS/CF

Sample ID: 54SB33A — Sample Collection Time: 14:35

Sampling Device: direct push — Depth (top): — Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: — Sample Collection Time:

Sampling Device: — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: — Sample Collection Time:

Sampling Device: — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 1/16/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/10/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear, 30° F	Sampling Team:	JS/CF

Sample ID: 54SB34A Sample Collection Time: 13:40

Sampling Device: direct push Depth (top): ____

Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	____		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB34B Sample Collection Time: 13:45

Sampling Device: direct push Depth (top): ____

Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	____		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB34C Sample Collection Time: 13:50

Sampling Device: direct push Depth (top): ____

Depth Interval: 18.5-19.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	____		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/10/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/11/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear 30° F	Sampling Team:	SS/CF

Sample ID: 545B38A Sample Collection Time: 11:35

Sampling Device: direct push Depth (top): ____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	✓ CF		
PCB congeners	✓		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 545B38B Sample Collection Time: 11:42

Sampling Device: direct push Depth (top): ____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	____		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 545B38C Sample Collection Time: 11:50

Sampling Device: direct push Depth (top): ____ Depth Interval: 16-17

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	____		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: DUP6 Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/11/07

39

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/8/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear, cold wind	Sampling Team:	JS/CK

Sample ID: 54SB39A — Sample Collection Time: 15:35

Sampling Device: direct push — Depth (top): — Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB39B — Sample Collection Time: 15:40

Sampling Device: direct push — Depth (top): — Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB39C — Sample Collection Time: 15:45

Sampling Device: direct push — Depth (top): — Depth Interval: 15-16

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed: 1/8/07

40

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/8/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear, cold, wind	Sampling Team:	JS/CF

Sample ID: 54SB40A — Sample Collection Time: 15:15

Sampling Device: direct push — Depth (top): — Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB40B — Sample Collection Time: 15:25

Sampling Device: direct push — Depth (top): — Depth Interval: 8-9

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB40C — Sample Collection Time: 15:30

Sampling Device: direct push — Depth (top): — Depth Interval: 11-12

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 1/8/07

41

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear 32° F	Sampling Team:	JS/LF

Sample ID: 54SB41A Sample Collection Time: 8:50

Sampling Device: direct push Depth (top): 0-0.6

Depth Interval:

Sample Containers/Preservatives

Dioxin/Furans: ✓ Physical Analysis:

Pesticides: PID Reading:

Metals:

PCBs:

PCB congeners:

Explosives:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB41B Sample Collection Time: 8:55

Sampling Device: direct push Depth (top):

Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans: ✓ Physical Analysis:

Pesticides: PID Reading:

Metals:

PCBs:

PCB congeners:

Explosives:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB41C Sample Collection Time: 9:00

Sampling Device: direct push Depth (top):

Depth Interval: 14-15

Sample Containers/Preservatives

Dioxin/Furans: ✓ Physical Analysis:

Pesticides: PID Reading:

Metals:

PCBs:

PCB congeners:

Explosives:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 1/9/07

42

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/8/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear, cold wind	Sampling Team:	

Sample ID: 54SB42A Sample Collection Time: 16:00

Sampling Device: direct push Depth (top):

Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: DUP-1 Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB42B Sample Collection Time: 16:15

Sampling Device: direct push Depth (top):

Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB42C Sample Collection Time: 16:25

Sampling Device: direct push Depth (top):

Depth Interval: 13.5-14.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 1/8/07

43

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/8/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear, cold strong wind	Sampling Team:	JS/LF

Sample ID: 54SB43A Sample Collection Time: 14:40

Sampling Device: direct push Depth (top): ____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB43B Sample Collection Time: 14:50

Sampling Device: direct push Depth (top): ____ Depth Interval: 5-6

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB43C Sample Collection Time: 14:55

Sampling Device: direct push Depth (top): ____ Depth Interval: 8-9

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/8/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear 32°F	Sampling Team:	JS/CE

Sample ID: 545B45A Sample Collection Time: 9:14

Sampling Device: direct push Depth (top): ____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 545B45B Sample Collection Time: 9:18

Sampling Device: direct push Depth (top): ____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 545B45C Sample Collection Time: 9:23

Sampling Device: direct push Depth (top): ____ Depth Interval: 12-13

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/9/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	cloudy 32° F	Sampling Team:	JS/CF

Sample ID: 54SB46A Sample Collection Time: 10:30

Sampling Device: direct push Depth (top): ____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	✓		
PCB congeners	✓		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB46C Sample Collection Time: 10:45

Sampling Device: direct push Depth (top): ____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	✓		
PCB congeners	✓		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: ____ Sample Collection Time: ____

Sampling Device: ____ Depth (top): ____ Depth Interval: ____

Sample Containers/Preservatives

Dioxin/Furans	____	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	____		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/9/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	32°F, cloudy	Sampling Team:	JS/CR

Sample ID: 54SB47A — Sample Collection Time: 11:13

Sampling Device: direct push — Depth (top): ____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB47B — Sample Collection Time: 11:23

Sampling Device: direct push — Depth (top): ____ Depth Interval: 6-7

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB47C — Sample Collection Time: 11:33

Sampling Device: direct push — Depth (top): ____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/9/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	snowing, 32°F	Sampling Team:	JS/CE

Sample ID: 54SB50A Sample Collection Time: 12:50

Sampling Device: direct push Depth (top): _____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	_____
Pesticides	_____	PID Reading:	_____
Metals	_____		
PCBs	_____		
PCB congeners	_____		
Explosives	_____		

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 54SB50B Sample Collection Time: 13:00

Sampling Device: direct push Depth (top): _____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	_____
Pesticides	_____	PID Reading:	_____
Metals	_____		
PCBs	_____		
PCB congeners	_____		
Explosives	_____		

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 54SB50C Sample Collection Time: 13:05

Sampling Device: direct push Depth (top): _____ Depth Interval: 11.5-12.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	_____
Pesticides	_____	PID Reading:	_____
Metals	_____		
PCBs	_____		
PCB congeners	_____		
Explosives	_____		

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: Chris Fuchs Date Completed: 1/9/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	cloudy, 32°F	Sampling Team:	JS/CE

Sample ID: 54SB53A — Sample Collection Time: 10:50

Sampling Device: direct push — Depth (top): — Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB53B — Sample Collection Time: 11:00

Sampling Device: direct push — Depth (top): — Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 54SB53C — Sample Collection Time: 11:10

Sampling Device: direct push — Depth (top): — Depth Interval: 12-13

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 1/9/07

54

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear 32° F	Sampling Team:	JS/CF

Sample ID: 54SB54A Sample Collection Time: 9:45

Sampling Device: direct push Depth (top): ____

Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	____		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB54B Sample Collection Time: 9:55

Sampling Device: direct push Depth (top): ____

Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	____		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: DUP2 Photo No: ____

MS/MSD Samples Taken Here: MS/MSD

Sample ID: 54SB54C Sample Collection Time: 10:05

Sampling Device: direct push Depth (top): ____

Depth Interval: 12-13

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	____	PID Reading:	____
Metals	____		
PCBs	____		
PCB congeners	____		
Explosives	____		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/9/07

57

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/11/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear, 30°F	Sampling Team:	JS, CF

Sample ID: 54SB57A Sample Collection Time: 12:10

Sampling Device: direct push Depth (top): _____

Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	_____	Physical Analysis:	_____
Pesticides	_____	PID Reading:	_____
Metals	_____		
PCBs	✓		
PCB congeners	✓		
Explosives	_____		

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: _____ Sample Collection Time: _____

Sampling Device: _____ Depth (top): _____

Depth Interval: _____

Sample Containers/Preservatives

Dioxin/Furans	_____	Physical Analysis:	_____
Pesticides	_____	PID Reading:	_____
Metals	_____		
PCBs	_____		
PCB congeners	_____		
Explosives	_____		

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: _____ Sample Collection Time: _____

Sampling Device: _____ Depth (top): _____

Depth Interval: _____

Sample Containers/Preservatives

Dioxin/Furans	_____	Physical Analysis:	_____
Pesticides	_____	PID Reading:	_____
Metals	_____		
PCBs	_____		
PCB congeners	_____		
Explosives	_____		

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: _____ Date Completed: 1/11/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/10/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	partly cloudy, 27° F	Sampling Team:	JS/LE

Sample ID: 54SB58A Sample Collection Time: 11:17

Sampling Device: direct push Depth (top): _____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans ✓ Physical Analysis: _____

Pesticides _____ PID Reading: _____

Metals _____

PCBs _____

PCB congeners _____

Explosives _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 54SB58B Sample Collection Time: 11:23

Sampling Device: direct push Depth (top): _____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans ✓ Physical Analysis: _____

Pesticides _____ PID Reading: _____

Metals _____

PCBs _____

PCB congeners _____

Explosives _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 54SB58C Sample Collection Time: 11:29

Sampling Device: direct push Depth (top): _____ Depth Interval: 20.7-21.7

Sample Containers/Preservatives

Dioxin/Furans ✓ Physical Analysis: _____

Pesticides _____ PID Reading: _____

Metals _____

PCBs _____

PCB congeners _____

Explosives _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: DUP5 Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 1/10/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	Snowing, 32°F	Sampling Team:	JS/LR

Sample ID: 54SB77A Sample Collection Time: 15:10

Sampling Device: direct push Depth (top): _____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	_____
Pesticides	_____	PID Reading:	_____
Metals	_____		
PCBs	_____		
PCB congeners	_____		
Explosives	_____		

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 54SB77B Sample Collection Time: 15:20

Sampling Device: direct push Depth (top): _____ Depth Interval: 7-8

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	_____
Pesticides	_____	PID Reading:	_____
Metals	_____		
PCBs	_____		
PCB congeners	_____		
Explosives	_____		

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 54SB77C Sample Collection Time: 15:30

Sampling Device: direct push Depth (top): _____ Depth Interval: 10-11

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	_____
Pesticides	_____	PID Reading:	_____
Metals	_____		
PCBs	_____		
PCB congeners	_____		
Explosives	_____		

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: DUP4 Photo No: _____

MS/MSD Samples Taken Here: ~~MS/MSD~~

Signature of Samplers: _____ Date Completed: 1/9/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	Snowing, 32°F	Sampling Team:	JS/CP

Sample ID: 545B78A Sample Collection Time: 11:35

Sampling Device: direct push Depth (top): ____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 545B78B Sample Collection Time: 11:38

Sampling Device: direct push Depth (top): ____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: DUP 3 Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 545B78C Sample Collection Time: 11:40

Sampling Device: direct push Depth (top): ____ Depth Interval: 13.5-14.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/9/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	Snow	Sampling Team:	Spangler / Franklin

Sample ID: 545B79A — Sample Collection Time: 1440

Sampling Device: glove/scoop — Depth (top): — Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	X	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 545B79B — Sample Collection Time: 1450

Sampling Device: glove/scoop — Depth (top): — Depth Interval: 7-8

Sample Containers/Preservatives

Dioxin/Furans	X	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 545B79C — Sample Collection Time: 1500

Sampling Device: glove/scoop — Depth (top): — Depth Interval: 9.5-10.5

Sample Containers/Preservatives

Dioxin/Furans	X	Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed: 1/9/07

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Project Information

Project Name:	SWMU 54 - RFI	Date:	1/9/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	snowing, 32°F	Sampling Team:	JS/LF

Sample ID: 54SB80A Sample Collection Time: 13:10

Sampling Device: direct push Depth (top): _____

Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans ✓ Physical Analysis: _____

Pesticides _____ PID Reading: _____

Metals _____

PCBs _____

PCB congeners _____

Explosives _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 54SB80B Sample Collection Time: 13:17

Sampling Device: direct push Depth (top): _____

Depth Interval: 5-6

Sample Containers/Preservatives

Dioxin/Furans ✓ Physical Analysis: _____

Pesticides _____ PID Reading: _____

Metals _____

PCBs _____

PCB congeners _____

Explosives _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 54SB80C Sample Collection Time: 13:21

Sampling Device: direct push Depth (top): _____

Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans ✓ Physical Analysis: _____

Pesticides _____ PID Reading: _____

Metals _____

PCBs _____

PCB congeners _____

Explosives _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 1/9/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/10/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	partly cloudy, 30°F	Sampling Team:	JS/CF

Sample ID: 545B81A — Sample Collection Time: 13:06

Sampling Device: direct push — Depth (top): ____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals	✓		
PCBs	✓		
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Dup 3 Lead Only — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 545B81B — Sample Collection Time: 13:11

Sampling Device: direct push — Depth (top): ____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals	✓		
PCBs	✓		
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here: MS/MSD Lead Only

Sample ID: 545B81C — Sample Collection Time: 13:16

Sampling Device: direct push — Depth (top): ____ Depth Interval: 19-20

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals	✓		
PCBs	✓		
PCB congeners			
Explosives			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ~~DUP 3 Lead Only~~ CF — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 1/10/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/12/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	cloudy, 30°F	Sampling Team:	JS/LF

Sample ID: 54SB82A — Sample Collection Time: 10:05

Sampling Device: direct push — Depth (top): ____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	✓	PID Reading:	____
Metals	____		
PCBs	✓		
PCB congeners	____		
Explosives	✓		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB82B — Sample Collection Time: 10:10

Sampling Device: direct push — Depth (top): ____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	✓	PID Reading:	____
Metals	____		
PCBs	✓		
PCB congeners	____		
Explosives	✓		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: MS/MSD for both

Sample ID: 54SB82C — Sample Collection Time: 10:15

Sampling Device: direct push — Depth (top): ____ Depth Interval: 18-19

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	____
Pesticides	✓	PID Reading:	____
Metals	____		
PCBs	✓		
PCB congeners	____		
Explosives	✓		

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: Formative Paradyme DUP4, DUP7 Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/12/07

Project Information

Project Name:	SWMU 54 - RFI	Date:	1/11/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear, 25°F	Sampling Team:	JS/CF

Sample ID: 54SB83A Sample Collection Time: 10:17

Sampling Device: direct push Depth (top): ____ Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives	✓		

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 54SB83B Sample Collection Time: 10:17

Sampling Device: direct push Depth (top): ____ Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives	✓		

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: MS/MSD

Sample ID: 54SB83C Sample Collection Time: 10:24

Sampling Device: direct push Depth (top): ____ Depth Interval: 21-22

Sample Containers/Preservatives

Dioxin/Furans	✓	Physical Analysis:	
Pesticides	✓	PID Reading:	
Metals			
PCBs	✓		
PCB congeners			
Explosives	✓		

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: DUP3 Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 1/11/07

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Project Information

Project Name:	SWMU 54 - RFI	Date:	1/11/07
Facility Name:	SWMU 54 - RFI	Client:	RFAAP
URS Project No.:	11656351.30001	Sampling Event:	Soil Sampling
Weather Conditions:	clear, 25°	Sampling Team:	JS/CK

Sample ID: SWSB54A — Sample Collection Time: 9:45

Sampling Device: direct push — Depth (top): — Depth Interval: 0-0.5

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives	✓		
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: SWSB54B — Sample Collection Time: 9:50

Sampling Device: direct push — Depth (top): — Depth Interval: 9-10

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives	✓		
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: SWSB54C — Sample Collection Time: 9:55

Sampling Device: direct push — Depth (top): — Depth Interval: ~~15-16~~ 15-16

Sample Containers/Preservatives

Dioxin/Furans		Physical Analysis:	
Pesticides		PID Reading:	
Metals			
PCBs			
PCB congeners			
Explosives	✓		
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 1/11/07

2nd QUARTER GROUNDWATER SAMPLING
March 2007

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Project Information

Monitoring Well ID:	54 MW-1	Depth to Water:	17.21
		Total Well Depth:	
Project Name:	SWMU 54 - GWQ2	Date:	3/28/07
Facility Name:	Radford Army Ammunition Plant	Client:	Radford Army Ammunition Plant
URS Project No.:	11656351	Sampling Event:	SWMU 54 - 2nd Quarter GW
Weather Conditions:	Sunny 70	Sampling Team:	JS/CF

Purge Equipment

Dedicated Bladder Pump:	[ ]	Peristaltic Pump:	[✓]
Dedicated Submersible Pump:	[ ]	Dedicated Bailer:	[ ]
Submersible Pump:	[ ]	Disposable Bailer:	[ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 DO Meter:

Conductivity Meter: _____ µs standard solution Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250
milliliters per minute
[✓]
gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
930	250	0	clear	7.61	13.50	0.197	7.69	1.55	-15
435	↓	1250	↑	7.60	13.50	0.195	7.48	1.18	-15
940		2500		7.59	13.51	0.195	7.43	1.96	-13
945		3750		7.59	13.54	0.194	7.40	1.09	-12
950	↓	5000	↓	7.59	13.57	0.194	7.25	1.48	-11

Sampling Data

Monitoring Well ID: 54MW-1 Sample Collection Time: 955

Sampling Device:

Dedicated Bladder Pump:		Peristaltic Pump:	✓
Dedicated Submersible Pump:		Dedicated Bailer:	
Submersible Pump:		Disposable Bailer:	

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU):	7.63	Final Conductivity (µs):	0.199	Final Turbidity (NTU):	1.82
Final Temperature (°C):	13.44	Final DO:	8.06	Final ORP:	-5
				Date Completed:	3/28/07

Well Locked At: 1010 Signature of Samplers:

Project Information

Monitoring Well ID: 54MW-2
Depth to Water: 21.27
Total Well Depth:

Project Name: SWMU 54 - GWQ2
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: Sunny 80
Date: 3/28/07
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - 2nd Quarter GW
Sampling Team: JS/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [✓]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

PLUS MS/MSD

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250 milliliters per minute [✓]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1108	250	0	Clear	7.01	14.91	0.244	6.56	0.53	-23
1110	↓	~~0~~ 500	↓	7.01	14.70	0.245	5.90	1.03	-32
1115		~~1750~~		7.01	14.71	0.245	5.45	1.25	-37
1120		~~3000~~		7.01	14.73	0.245	5.24	0.38	-39
1125		~~4250~~		7.01	14.94	0.245	5.04	0.43	-40
1128		5500		7.02	14.88	0.245	5.07	0.37	-40

Sampling Data

Monitoring Well ID: 54MW-2
Sample Collection Time: 1130

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

4 Ambers
3 plastic
no HNO3
Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
Photo No:
MS/MSD Samples Taken Here: Yes

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No
Final pH (SU): 6.45
Final Temperature (°C): 15.80
Final Conductivity (µs): 0.183
Final DO: 7.75
Final Turbidity (NTU): 0.37
Final ORP: 44
Date Completed: (11:57)
Well Locked At: 1145
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW3
Depth to Water: 22.54'
Total Well Depth:

Project Name: SWMU 54 - GWQ2
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: Sunny, 80°F
Date: 3/28/07
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - 2nd Quarter GW
Sampling Team: JS/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [X] 250
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1201	250	0	clear	6.96	20.51	0.305	6.34	3.30	1
1203	↓	500	↓	6.99	15.55	0.333	6.07		-24
1205		1000		6.98	15.72	0.321	5.78	3.17	-34
1207		1500		6.97	15.50	0.320	5.59		-40
1209		2000		6.96	15.41	0.319	5.46	2.35	-44
1211		2500		6.96	15.24	0.319	5.37		-46
1213		3000		6.96	14.98	0.318	5.37	2.16	-48
1215		3500		6.96	14.78	0.318	5.32		-50
1217		4000		6.97	14.72	0.318	5.24	2.26	-52
1219		4500		6.96	14.78	0.317	5.26		-52
1221	↓	5000	↓	6.96	14.85	0.317	5.16	2.07	-52

Sampling Data

Monitoring Well ID: 54MW3
Sample Collection Time: 1221

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No
Final pH (SU): 6.94
Final Temperature (°C): 16.22
Final Conductivity (µs): 0.311
Final DO: 6.12
Final Turbidity (NTU): 2.13
Final ORP: -41
Date Completed: 3/28/07

Well Locked At: 1256
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW4 — Depth to Water: 14.28 — Total Well Depth:

Project Name: SWMU 54 - GWQ2 — Date: 3/27/07
Facility Name: Radford Army Ammunition Plant — Client: Radford Army Ammunition Plant
URS Project No.: 11656351 — Sampling Event: SWMU 54 - 2nd Quarter GW
Weather Conditions: — Sampling Team: JS/CF

Purge Equipment

Dedicated Bladder Pump: [ ] — Peristaltic Pump: [ ]
Dedicated Submersible Pump: [ ] — Dedicated Bailer: [ ]
Submersible Pump: [ ] — Disposable Bailer: [ ]

WASPS IN well head :(ouch!

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 — DO Meter:
Conductivity Meter: _____ µs standard solution — Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250 milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1510	250	0	CLEAR	7.24	15.87	0.302	6.13	8.93	.45
1535		1250		7.17	15.91	0.296	5.32	5.69	-78
1540		2500		7.13	16.20	0.302	4.87	6.22	-99
1545		3750		7.10	15.99	0.390	4.68	4.57	-108
1550	↓	5000	↓	7.11	16.09	0.418	4.53	3.39	-113

Sampling Data

Monitoring Well ID: 54MW-4 — Sample Collection Time: 1555

Sampling Device:
Dedicated Bladder Pump: — Peristaltic Pump: ✓
Dedicated Submersible Pump: — Dedicated Bailer:
Submersible Pump: — Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU): 7.16 — Final Conductivity (µs): 1.11 — Final Turbidity (NTU): 1.54
Final Temperature (°C): 15.68 — Final DO: 5.97 — Final ORP: -95
Date Completed: 3/27/07

Well Locked At: 1610 — Signature of Samplers:

Project Information

Monitoring Well ID: 54MW05
Depth to Water: 16.72'
Total Well Depth:

Project Name: SWMU 54 - GWQ2
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: Sunny, 75°F
Date: 3/28/07
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - 2nd Quarter GW
Sampling Team: JS/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [X] 250
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1013	250	0	clear	6.53	18.72	0.156	7.93	3.07	57
1015		500		6.52	12.76	0.177	9.66		52
1017		1000		6.50	13.06	0.164	8.81	1.11	52
1019		1500		6.49	13.19	0.163	8.27		54
1021		2000		6.49	13.10	0.164	8.10	1.28	54
1023		2500		6.49	13.12	0.164	7.94		55
1025		3000		6.49	13.07	0.164	7.90	1.56	55
1027		3500		6.48	13.21	0.163	7.81		55
1029		4000		6.49	13.12	0.164	7.76	1.79	57
1031		4500		6.49	13.12	0.165	7.73		56
1033	↓	5000	↓	6.49	13.14	0.165	7.70	0.97	56

Sampling Data

Monitoring Well ID: 54MW05
Sample Collection Time: 1033

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs	____	(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC	____	
SVOCs	____	(1 liter, amber glass, 4°C)	TOX	____	
Pesticides	____	(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides	____	(1 liter, amber glass, 4°C)	Other	____	( )
Metals, Unfiltered	____	(1 liter, plastic HNO_3, pH<2, 4°C)	Other	____	( )
Metals, Filtered	____	(1 liter, plastic HNO_3, pH<2, 4°C)	Other	____	( )
PAHs	____	(1 liter, amber glass, 4°C)	Other	____	( )
Explosives	X	(1 liter, amber glass, 4°C)	Other	____	( )
Mercury	____	(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other	____	( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No

Final pH (SU): 6.65
Final Temperature (°C): 12.73
Final Conductivity (µs): 0.167
Final DO: 8.38
Final Turbidity (NTU): 1.22
Final ORP: 53
Date Completed: 3/28/07

Well Locked At: 1048
Signature of Samplers: Chris Franks

Project Information

Monitoring Well ID: 54mw6 — Depth to Water: 39.23 — Total Well Depth:

Project Name: SWMU 54 - GWQ2 — Date: 3/27/07

Facility Name: Radford Army Ammunition Plant — Client: Radford Army Ammunition Plant

URS Project No.: 11656351 — Sampling Event: SWMU 54 - 2nd Quarter GW

Weather Conditions: sunny, 70°F — Sampling Team: JS/CF

Purge Equipment

Dedicated Bladder Pump: [ ] — Peristaltic Pump: [X]

Dedicated Submersible Pump: [ ] — Dedicated Bailer: [ ]

Submersible Pump: [X] — Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10 — DO Meter:

Conductivity Meter: _____ µs standard solution — Turbidity Meter:

Purge Data

Purge Rate/Volume Units: milliliters per minute [X] 300 gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
957	300	0	orangish	7.89	15.74	0.372	7.51	960	280
959		600	↓	7.92	17.59	0.370	6.90		264
1001		1200	very cloudy	8.05	18.02	0.371	6.91	404	243
1003		1800		8.15	18.37	0.371	6.88		220
1005		2400	↓	8.17	18.64	0.371	6.90	236	188
1007		3000	↓	8.19	18.78	0.370	6.95		147
1009		3600	slightly cloudy	8.17	18.95	0.369	7.58	135	108
1011		4200	↓	8.16	18.91	0.368	7.26		101
1013		4800		8.16	18.95	0.366	7.22	90.4	94
1015		5400	↓	8.17	19.06	0.362	7.24		91
1017		6000	clear	8.17	19.11	0.359	7.28	42.6	89
1019		6600	↓	8.17	19.25	0.352	7.33	35.2	89
1021		7200	↓	8.17	19.22	0.347	7.42	26.6	89
1023	↓	8000	↓	8.16	19.37	0.342	7.46	25.5	88

Sampling Data

Monitoring Well ID: 54mw6 — Sample Collection Time: 1025

Sampling Device:

Dedicated Bladder Pump: — Peristaltic Pump: [X]

Dedicated Submersible Pump: — Dedicated Bailer:

Submersible Pump: X — Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No

Final pH (SU): 8.21 — Final Conductivity (µs): 0.314 — Final Turbidity (NTU): 31.1

Final Temperature (°C): 17.77 — Final DO: 8.58 — Final ORP: 135

Date Completed:

Well Locked At: 1040 — Signature of Samplers:

Project Information

Monitoring Well ID: 54MW07
Depth to Water: 14.80'
Total Well Depth:

Project Name: SWMU 54 - GWQ2
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: Sunny, 75°F
Date: 3/27/07
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - 2nd Quarter GW
Sampling Team: JS/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [X] 250
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1608	250	0	Clear	6.99	24.50	0.272	4.83	10.88	-12
1610		500		7.02	14.97	0.322	6.36		-28
1612		1000		6.99	15.40	0.306	5.36	8.68	-34
1614		1500		6.98	15.69	0.303	5.09		-36
1616		2000		6.98	15.11	0.308	5.16	7.90	-38
1618		2500		6.97	15.02	0.307	5.06		-39
1620		3000		6.98	15.06	0.306	5.03	7.85	-40
1622		3500		6.98	14.84	0.307	5.03		-40
1624		4000		6.97	14.36	0.309	5.06	7.65	-42
1626		4500		6.97	14.33	0.307	5.04		-43
1628	↓	5000	↓	6.97	14.44	0.305	5.02	7.51	-44

Sampling Data

Monitoring Well ID: 54MW07
Sample Collection Time: 1628

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No

Final pH (SU): 7.00
Final Temperature (°C): 14.25
Final Conductivity (µs): 0.323
Final DO: 6.00
Final Turbidity (NTU): 6.59
Final ORP: -44
Date Completed:

Well Locked At: 1643
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW-8
Depth to Water: 13.89
Total Well Depth:

Project Name: SWMU 54 - GWQ2
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: Sunny 75
Date: 3/27/07
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - 2nd Quarter GW
Sampling Team: JS/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [✓]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
200
milliliters per minute
[x]

gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1218	HORIB	A. Not	working	- use	Other				
1248	200	-	Bailed	dry	- Pkg				
1258	200	0	clear	6.97	18.92	0.265	6.21	28.3	-27
1300		400		7.00	14.99	0.267	6.78		-39
1305		1400		6.99	15.08	0.266	6.03	27.3	-39
1310		2400		6.97	14.63	0.266	6.00	16.53	-30
1315		3400		6.96	14.98	0.265	5.70	13.56	-28
1320		4400		6.99	15.23	0.266	5.55	15.95	-30
1325		5400		6.98	15.31	0.267	5.37	16.85	-33
1330	↓	6400	↓	6.98	15.64	0.266	5.29	16.01	-32

Sampling Data

Monitoring Well ID: 54MW-8
Sample Collection Time: 1330

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU): 7.05
Final Temperature (°C): 17.92
Final Conductivity (µs): 0.267
Final DO: 6.66
Final Turbidity (NTU): 13.96
Final ORP: -17
Date Completed: 3/27/07

Well Locked At: 1345
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW9
Depth to Water: 17.85'
Total Well Depth:

Project Name: SWMU 54 - GWQ2
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: partly cloudy, 76°F
Date: 3/22/07
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - 2nd Quarter GW
Sampling Team: JS/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute
[X]
250
gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1350	250	0	clear	7.13	21.80	0.352	6.33	6.45	3
1352		500		7.16	16.39	0.371	6.83		-12
1354		1000		7.14	15.65	0.366	6.40	5.57	-10
1356		1500		7.13	15.39	0.362	6.08		-14
1358		2000		7.13	15.28	0.365	6.08	4.95	-14
1400		2500		7.13	15.23	0.362	5.96		-14
1402		3000		7.12	15.44	0.360	5.85	3.98	-13
1404		3500		7.12	15.67	0.360	5.73		-12
1406		4000		7.12	15.79	0.362	5.68	4.51	-11
1408		4500		7.12	15.69	0.364	5.60		-10
1410	↓	5000	↓	7.13	15.24	0.368	5.69	4.96	-10

Sampling Data

Monitoring Well ID: 54MW9
Sample Collection Time: 1410

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No 0.96
Final pH (SU): 7.18
Final Temperature (°C): 14.43
Final Conductivity (µs):
Final DO: 6.51
Final Turbidity (NTU): 7.71
Final ORP: -10
Date Completed:

Well Locked At: 1425
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW10
Depth to Water: 17.44'
Total Well Depth:

Project Name: SWMU 54 - GWQ2
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: sunny, 75°F
Date: 3/27/07
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - 2nd Quarter GW
Sampling Team: JS/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
milliliters per minute [X] 250
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1149	250	0	clear	6.58	19.64	0.259	6.14	12.73	86
1151	↓	500	↓	6.601	15.53	0.286	7.11		26
1153		1000		6.601	15.39	0.285	6.94	13.44	25
1155		1500		6.67	14.85	0.288	6.99		25
1157		2000		6.603	15.11	0.286	6.83	14.18	24
1159		2500		6.64	15.31	0.285	6.75		24
1201		3000		6.65	14.90	0.289	6.79	14.44	22
1203		3500		6.67	15.12	0.290	6.605		20
1205		4000		6.71	14.87	0.297	6.53	11.43	16
1207		4500		6.73	15.11	0.298	6.36		12
1209		5000		6.75	15.08	0.305	6.20	9.77	10
1211	↓	5500	↓	6.75	15.15	0.304	6.13	7.14	9

Sampling Data

Monitoring Well ID: 54MW10
Sample Collection Time: 1211

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: DUP-1
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No
Final pH (SU): 6.88
Final Temperature (°C): 15.95
Final Conductivity (µs): 0.334
Final DO: 5.00
Final Turbidity (NTU): 3.64
Final ORP: 11
Date Completed:

Well Locked At: 1220
Signature of Samplers:

3rd QUARTER GROUNDWATER SAMPLING
June 2007

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Project Information

Monitoring Well ID: 54MW-1
Depth to Water: 18.22
Total Well Depth:

Project Name: SWMU 54 - GWQ3
Date: 6/5/07
Facility Name: Radford Army Ammunition Plant
Client: Radford Army Ammunition Plant
URS Project No.: 11656351
Sampling Event: SWMU 54 - Third Quarter GW
Weather Conditions: cloudy
Sampling Team: TD/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250 milliliters per minute
[X]
gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1909	250	0	clear	7.25	14.80	0.197	11.11	0.73	306
1915	250	~~2500~~	clear	7.35	13.39	0.195	8.60	0.74	303
1920	250	~~500~~	clear	7.36	13.52	0.192	7.94	0.75	299
1925	250	750	clear	7.35	13.33	0.192	7.61	0.69	297
1929	250	1000	clear	7.33	13.58	0.192	7.57	0.48	297

Sampling Data

Monitoring Well ID: 54MW-1
Sample Collection Time: 19:29

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No

Final pH (SU): 7.33
Final Temperature (°C): 13.58
Final Conductivity (µs): 0.192
Final DO: 7.57
Final Turbidity (NTU): 0.48
Final ORP: 297
Date Completed: 6/5/07

Well Locked At: 19:48
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW-3
Depth to Water: 23.79'
Total Well Depth:

Project Name: SWMU 54 - GWQ3
Date: 6/5/07
Facility Name: Radford Army Ammunition Plant
Client: Radford Army Ammunition Plant
URS Project No.: 11656351
Sampling Event: SWMU 54 - Third Quarter GW
Weather Conditions: partly cloudy, 75°F
Sampling Team: TD/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250
milliliters per minute
[X]
gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1710	250	0	clear	6.32	25.42	0.003	9.37	0.96	94
1715		1250		6.30	20.46	0.003	4.98	0.75	98
1720		2500		6.26	18.67	0.003	5.14	0.98	99
1725		3750		6.24	16.662	0.003	5.12	0.89	103
1730	↓	5000	↓	6.20	15.66	0.003	5.06	0.36	109

Sampling Data

Monitoring Well ID: 54MW-3
Sample Collection Time: 1730

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
Photo No:
MS/MSD Samples Taken Here:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No

Final pH (SU): 6.20
Final Conductivity (µs): 0.003
Final Turbidity (NTU): 0.36
Final Temperature (°C): 15.66
Final DO: 5.06
Final ORP: 109
Date Completed: 6/5/07

Well Locked At: 1748
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW-2
Depth to Water: 22.22
Total Well Depth:

Project Name: SWMU 54 - GWQ3
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: cloudy
Date: 6/5/07
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - Third Quarter GW
Sampling Team: TD/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250 milliliters per minute [X]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
14:50	250	0	clear	7.00	14.99	0.239	13.41	1.48	268
14:55	250	250	clear	6.83	13.52	0.257	9.84	1.11	270
15:00	250	500	clear	6.82	13.54	0.236	8.93	0.36	268
15:05	250	750	clear	6.82	13.54	0.236	8.44	0.50	266
15:10	250	1000	clear	6.72	13.48	0.225	8.46	0.29	268

Sampling Data

Monitoring Well ID: 54MW-2
Sample Collection Time: 5:10 1710

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here: MS/MSD-1
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No

Final pH (SU): 6.78
Final Temperature (°C): 13.48
Final Conductivity (µs): 0.225
Final DO: 8.46
Final Turbidity (NTU): 0.29
Final ORP: 268
Date Completed: 6/5/07

Well Locked At: 17:30
Signature of Samplers: CDCF

Project Information

Monitoring Well ID: 54MW-4
Depth to Water: 15.09
Total Well Depth:

Project Name: SWMU 54 - GWQ3
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: sunny
Date: 6/5/07
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - Third Quarter GW
Sampling Team: TD/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [✓]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250
milliliters per minute
[X]
gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
11:53	250	250	clear	6.14	19.85	0.003	4.96	1.14	88
11:58	250	250	clear	6.45	16.30	0.003	5.37	1.26	88
12:03	250	500	clear	6.42	15.30	0.003	5.36	0.91	88
12:08	250	750	clear	6.39	14.79	0.003	5.33	0.55	88
12:13	250	1000	clear	6.39	14.48	0.003	5.22	0.97	90

Sampling Data

Monitoring Well ID: 54MW-4
Sample Collection Time: 12:18

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other	X	(Dioxin/Furans)
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: DUP-1
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No
Final pH (SU): 6.39
Final Temperature (°C): 14.54
Final Conductivity (µs): 0.003
Final DO: 5.15
Final Turbidity (NTU): 0.67
Final ORP: 91
Date Completed: 6/5/07

Well Locked At: 12:56
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW-5
Depth to Water: 17.60
Total Well Depth:

Project Name: SWMU 54 - GWQ3
Date: 6/5/07
Facility Name: Radford Army Ammunition Plant
Client: Radford Army Ammunition Plant
URS Project No.: 11656351
Sampling Event: SWMU 54 - Third Quarter GW
Weather Conditions: cloudy
Sampling Team: TD/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250 milliliters per minute
[X]
gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
18:18	250	0	clear	6.52	13.72	0.164	12.42	3.48	295
18:23	250	250	clear	6.41	12.72	0.164	10.90	1.34	303
18:28	250	500	clear	6.38	12.58	0.160	10.15	1.04	310
18:33	250	750	clear	6.37	12.60	0.162	9.81	0.65	313
18:38	250	1000	clear	6.24	12.68	0.163	8.44	0.67	236

Sampling Data

Monitoring Well ID: 54MW-5
Sample Collection Time: 18:40

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
Photo No:
MS/MSD Samples Taken Here:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No
Final pH (SU): 6.24
Final Temperature (°C): 12.68
Final Conductivity (µs): 0.163
Final DO: 8.44
Final Turbidity (NTU): 0.67
Final ORP: 236
Date Completed: 6/1

Well Locked At: 1855
Signature of Samplers: CD/CF

Project Information

Monitoring Well ID: 54MW-6
Depth to Water: 39.27
Total Well Depth:

Project Name: SWMU 54 - GWQ3
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: partly cloudy
Date:
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - Third Quarter GW
Sampling Team: TD/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [X]
Peristaltic Pump: [ ]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250 milliliters per minute [X]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1031	250	0	particulate present	6.09	19.35	0.004	4.74	27.3	68
1033		500		6.08	17.95	0.004	4.96		68
1035		1000		6.08	17.54	0.004	4.97	50.3	69
1037		1500		6.07	16.89	0.004	5.00		70
1039		2000	cloudy	6.06	16.87	0.003	4.96	89.6	71
1041		2500		6.04	17.38	0.003	4.79		72
1043		3000	clears	6.03	17.63	0.003	4.74	38.8	72
1045		3500		6.02	17.98	0.004	4.67		73
1047		4000		6.02	18.19	0.004	4.66	21.1	74
1049		4500		6.02	18.59	0.003	4.60		75
1051		5000		6.02	18.81	0.003	4.56	12.16	75
1053		5500		6.02	18.96	0.003	4.55	11.64	75
1055		6000		6.03	19.12	0.003	4.52	12.67	76
1057		6500		6.03	19.28	0.003	4.50	9.96	76

Sampling Data

Monitoring Well ID: 54MW-6
Sample Collection Time: 1055

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump: X
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other	X	(Nitrate/Nitrite)
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No

Final pH (SU): 6.03
Final Temperature (°C): 19.28
Final Conductivity (µs): 0.003
Final DO: 4.50
Final Turbidity (NTU): 9.96
Final ORP: 76
Date Completed: 4/5/07

Well Locked At: 1110
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW-7
Depth to Water: 15.71'
Total Well Depth:

Project Name: SWMU 54 - GWQ3
Date:
Facility Name: Radford Army Ammunition Plant
Client: Radford Army Ammunition Plant
URS Project No.: 11656351
Sampling Event: SWMU 54 - Third Quarter GW
Weather Conditions: Sunny, 80°F
Sampling Team: TD/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250
milliliters per minute
[X]
gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1217	250	0	clear	6.96	13.00	0.307	12.17	2.02	318
1219	↓	500	↓	6.96	13.19	0.303	10.28		304
1221		1000		6.96	13.05	0.302	9.77	1.75	296
1223		1500		6.96	13.16	0.300	8.85		274
1225		2000		6.96	13.07	0.301	8.50	0.96	263
1227		2500		6.97	12.92	0.301	8.38		257
1229		3000		6.97	13.07	0.299	8.20	1.00	250
1231		3500		6.97	13.17	0.300	7.99		241
1233		4000		6.97	13.15	0.300	7.90	1.17	236
1235		4500		6.97	13.13	0.301	7.78		228
1237	↓	5000	↓	6.97	13.03	0.307	7.72	0.71	225

Sampling Data

Monitoring Well ID:
Sample Collection Time: 1237

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
Photo No:
MS/MSD Samples Taken Here:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No

Final pH (SU): 6.97
Final Temperature (°C): 13.03
Final Conductivity (µs): 0.307
Final DO: 7.72
Final Turbidity (NTU): 0.71
Final ORP: 225
Date Completed: 6/5/07

Well Locked At: 1253
Signature of Samplers:

Project Information

Monitoring Well ID: 54MW-8
Depth to Water: 14.08
Total Well Depth:

Project Name: SWMU 54 - GWQ3
Date: 6/5/07
Facility Name: Radford Army Ammunition Plant
Client: Radford Army Ammunition Plant
URS Project No.: 11656351
Sampling Event: SWMU 54 - Third Quarter GW
Weather Conditions:
Sampling Team: TD/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250 milliliters per minute [X]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
13:53	250	0	clear	6.96	14.88	0.249	12.14	1.87	291
13:58	250	250	clear	6.91	13.83	0.246	10.13	0.46	291
14:03	250	500	clear	6.90	13.74	0.246	9.30	0.39	289
14:08	250	750	clear	6.90	13.75	0.245	8.99	0.14	287
14:13	250	1000	clear	6.90	13.74	0.245	8.82	0.06	285

Sampling Data

Monitoring Well ID: 54MW-8
Sample Collection Time: 14:13

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No

Final pH (SU): 6.90
Final Temperature (°C): 13.74
Final Conductivity (µs): 0.245
Final DO: 8.82
Final Turbidity (NTU): 0.06
Final ORP: 285
Date Completed: 6/5/07

Well Locked At: 14:35
Signature of Samplers: [signature]

Project Information

Monitoring Well ID:	54MW-9	Depth to Water:	18.73'
		Total Well Depth:	
Project Name:	SWMU 54 - GWQ3	Date:	6/5/07
Facility Name:	Radford Army Ammunition Plant	Client:	Radford Army Ammunition Plant
URS Project No.:	11656351	Sampling Event:	SWMU 54 - Third Quarter GW
Weather Conditions:	sunny, 85°F	Sampling Team:	TD/CF

Purge Equipment

Dedicated Bladder Pump:	[ ]	Peristaltic Pump:	[X]
Dedicated Submersible Pump:	[ ]	Dedicated Bailer:	[ ]
Submersible Pump:	[ ]	Disposable Bailer:	[ ]

Equipment Calibration

pH Meter Calibrated with Buffers:	[ ]4 [ ]7 [ ]10	DO Meter:	
Conductivity Meter: _____ µs standard solution		Turbidity Meter:	

Purge Data

Purge Rate/Volume Units:
250
milliliters per minute
[X]
gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
1415	250	0	clear	6.25	23.15	0.003	4.28	1.07	88
1417	↓	500	↓	6.24	22.91	0.003	4.59		89
1419		1000		6.24	21.08	0.003	4.83	0.79	90
1421		1500		6.24	18.70	0.003	5.16		91
1423		2000		6.24	17.59	0.003	5.26	1.27	92
1425		2500		6.24	17.04	0.003	5.29		92
1427		3000		6.25	16.37	0.003	5.32	1.13	93
1429		3500		6.25	16.05	0.003	5.31		93
1431		4000		6.25	15.79	0.003	5.30	1.06	93
1433		4500		6.25	15.53	0.003	5.26		93
1435	↓	5000	↓	6.25	15.44	0.003	5.21	1.67	94

Sampling Data

Monitoring Well ID:	54MW-9	Sample Collection Time:	1435

Sampling Device:

Dedicated Bladder Pump:		Peristaltic Pump:	X
Dedicated Submersible Pump:		Dedicated Bailer:	
Submersible Pump:		Disposable Bailer:	

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:		Photo No:	
MS/MSD Samples Taken Here:			

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No

Final pH (SU):	6.25	Final Conductivity (µs):	0.003	Final Turbidity (NTU):	1.67
Final Temperature (°C):	15.44	Final DO:	5.21	Final ORP:	94
				Date Completed:	6/5/07

Well Locked At: 1450 Signature of Samplers:

Project Information

Monitoring Well ID: 54MW-10
Depth to Water: 16.38
Total Well Depth:

Project Name: SWMU 54 - GWQ3
Facility Name: Radford Army Ammunition Plant
URS Project No.: 11656351
Weather Conditions: sunny
Date: 6/15/07
Client: Radford Army Ammunition Plant
Sampling Event: SWMU 54 - Third Quarter GW
Sampling Team: TD/CF

Purge Equipment

Dedicated Bladder Pump: [ ]
Dedicated Submersible Pump: [ ]
Submersible Pump: [ ]
Peristaltic Pump: [X]
Dedicated Bailer: [ ]
Disposable Bailer: [ ]

Equipment Calibration

pH Meter Calibrated with Buffers: [ ]4 [ ]7 [ ]10
Conductivity Meter: _____ µs standard solution
DO Meter:
Turbidity Meter:

Purge Data

Purge Rate/Volume Units:
250
milliliters per minute
[X]
gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp °C	Cond (ms)	DO	Turbidity (ntu)	ORP
15:30	250	0	clear	7.10	14.60	0.363	10.67	18.76	291
15:35	250	250	clear	6.97	14.24	0.355	8.49	13.14	258
15:40	250	500	clear	6.96	14.26	0.354	8.01	16.61	233
15:45	250	750	clear	6.97	14.38	0.354	7.60	10.84	202
15:50	250	1000	clear	6.97	14.51	0.353	7.35	9.37	187

Sampling Data

Monitoring Well ID: 54MW-10
Sample Collection Time: 15:50

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	TOC		
SVOCs		(1 liter, amber glass, 4°C)	TOX		
Pesticides		(1 liter, amber glass, 4°C)	Other	X	(Perchlorate)
Herbicides		(1 liter, amber glass, 4°C)	Other		( )
Metals, Unfiltered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
Metals, Filtered		(1 liter, plastic HNO_3, pH<2, 4°C)	Other		( )
PAHs		(1 liter, amber glass, 4°C)	Other		( )
Explosives	X	(1 liter, amber glass, 4°C)	Other		( )
Mercury		(1 liter, amber glass, HNO_3, pH<2, 4°C)	Other		( )

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [X]No
Final pH (SU): 6.97
Final Temperature (°C): 14.51
Final Conductivity (µs): 0.353
Final DO: 7.35
Final Turbidity (NTU): 9.37
Final ORP: 187
Date Completed: 6/15/07

Well Locked At: 16:09
Signature of Samplers: CD/CF

4th QUARTER GROUNDWATER SAMPLING
September 2007

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MONITORING WELL INSPECTION LOG

PROJECT NAME: RFAAP-SWMU 34 - Qtr 4

URS PROJECT NO. 11656351

FACILITY NAME: RFAAP

MONITORING WELL: 54MW1

A. Inspected by (full name): Christina DeVine

B. Date/Time of Inspection: 14:15 9/19/07

C. Inspection Observations:

1. Locking protective casing:
   no lock
2. Concrete well Pad:
   intact
3. Lock:
   not present
4. Erosion:
   none observed
5. Exterior well identification number:
   placard on top of well

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

See MW 2

INITIAL CALIBRATION	FINAL CALIBRATION
DATE:	DATE:
TIME:	TIME:

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
4.0			

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER _____			

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

COMMENTS_____

SIGNATURE_____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	RFAAP-SWMU 84 - Qtr 4	Date:	9/19/07
Facility Name:	RFAAP	Client:	RFAAP
URS Project No.:	11656351	Sampling Event:	GW qtrly Qtr
Weather Conditions:	sunny		
Sampling Team:	Jim Carter/Tina DeVine		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	84MW1	Organic Vapor Headspace:	– ppm
Time Well Casing Unlocked:	12:07	Combustible Gas:	– %LEL
Well Stickup from Ground Surface (Inner Casing):	1.92 ft		
Well Stickup from Ground Surface (Outer Casing):	2.13 ft	Height of Water H_w [a-b]	37.63 ft
Depth to Water Top of Inner/Outer casing:[a]	19.68 ft		
Depth to Immiscible Layer	– ft	Measurement Technique:	
Thickness of Immiscible Layer	– ft	water level meter + tape measure	
Total Depth of Well From top of Inner/Outer Casing [b]:	57.31 ft		

Well Construction and Purge Volume Calculation

Screened Well [X]

Boring Radius (r_b)	ft
Nominal Radius of Casing (r_c)	ft
Height of Sand Pack (h_s)	ft
Length of Screen	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]
Low Flow Purge/Low Flow Sampling: [X]
Other:

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump:	[ ]		[ ]
Peristaltic Pump:	[X]		[ ]

Field Groundwater Monitoring Log

Project Information

Project Name: RFAAP-SWMU 54 - Qtr 4
Facility Name: RFAAP-
URS Project No.: 11656351
Weather Conditions: sunny
Sampling Team: Jim Carter/Tina DeVine

Event: GW 4th Qtr
Date: 9/19/07
Facility: RFAAP
Well ID: 54MW1

Purge Data

Purge Rate/Volume Units:
milliliters per minute [X]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)
14:20	100	—	clear	8.36	22.57	0.490	6.20	236	2.36
14:25	100	500	clear	8.33	22.20	0.489	6.07	237	2.28
14:30	100	1,000	clear	8.27	20.78	0.488	4.95	240	2.27
14:35	100	1,500	clear	8.22	20.06	0.487	4.45	239	0.73
14:40	100	2,000	clear	8.20	19.80	0.486	4.13	234	0.91
Stopped purging at			1440						

Sampling Data

Monitoring Well ID: 54MW1
Sample Collection Time: 1443

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	Perchlorate	1	(250ml plastic, no pres, 4°C)
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives	(2) X	(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU): 9.20
Final Temperature (°C): 19.79
Final Conductivity (µs): 0467
Final DO: 01.03
Final Turbidity: 0.79 ntu
Final ORP: -33
Date Completed: 9/19/07

Well Locked At: 369
Signature of Samplers:

MONITORING WELL INSPECTION LOG

PROJECT NAME: RFAAP-SWMU54-Qtr 4

URS PROJECT NO. 11656351

FACILITY NAME: RFAAP

MONITORING WELL: 54MW2

A. Inspected by (full name): Christine Devine

B. Date/Time of Inspection: 9/19/07

C. Inspection Observations:

1. Locking protective casing:
   Rainbow
2. Concrete well Pad:
   intact
3. Lock:
   no lock present
4. Erosion:
   none useable
5. Exterior well identification number:
   no number on exterior

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

INITIAL CALIBRATION	FINAL CALIBRATION
DATE: 9/19/07	DATE:
TIME: 9:43	TIME:

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: AutoCal Soln pH 4.00 8.0 NTU 4.49 mS/cm

METER ID Horiba U22XD MFGN 303306

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0	~~2.97~~		
10.0			
4.0	2.77	4.00	4.1

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	4.66	4.52	4.50

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER ambient air	13.60	13.84	13.96

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
	23.6	0.0	0.2

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
–	319	315	320

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
–	10.53	9.61	9.82

COMMENTS_____

SIGNATURE_____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	RFAAP-SWMU 54- Qtr 4	Date:	9/19/07
Facility Name:	RFAAP	Client:	RFAAP
URS Project No.:	11052351	Sampling Event:	GW 4th Qtr
Weather Conditions:	sunny		
Sampling Team:	Jim Carter/Tina DeVine		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	BHMW2	Organic Vapor Headspace:	– ppm
Time Well Casing Unlocked:	9:45	Combustible Gas:	– %LEL
Well Stickup from Ground Surface (Inner Casing):	~~0.22~~ 2.19 ft		
Well Stickup from Ground Surface (Outer Casing):	2.41 ft	Height of Water H_w [a-b]	7.4 ft
Depth to Water Top of (Inner)/Outer casing:[a]	22.94 ft		
Depth to Immiscible Layer	– ft	Measurement Technique:	
Thickness of Immiscible Layer	– ft	water level meter and tape measure	
Total Depth of Well From top of (Inner)/Outer Casing [b]:	30.34 ft		

Well Construction and Purge Volume Calculation

Screened Well [X]

Boring Radius (r_b)	ft
Nominal Radius of Casing (r_c)	ft
Height of Sand Pack (h_s)	ft
Length of Screen	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]
Low Flow Purge/Low Flow Sampling: [X]
Other:

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump:	[ ]		[ ]
Peristaltic Pump:	[X]		[ ]

Field Groundwater Monitoring Log

Project Information

Project Name: RFAAP - SWMU 54 - Qtr 4
Facility Name: RFAAP
URS Project No.: 11036351
Weather Conditions: Sunny
Sampling Team: Jim Calder / Tina DeVine

Event: GW 4th Qtr
Date: 9/19/07
Facility: RFAAP
Well ID: 54MW2

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

MS/MSD

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)
1010	150	0	clear	6.56	14.78	0.643	2.98	237	3.81
1015	150	750	clear	6.64	14.76	0.643	2.85	224	3.49
1020	150	1,500	clear	6.81	14.93	0.643	2.61	185	3.17
1025	150	2,250	clear	6.98	15.37	0.641	2.43	160	2.60
1030	200	3250	clear	7.01	15.65	0.640	2.37	163	2.17
1035	200	4250	clear	7.00	15.78	0.638	2.36	170	2.84
Stopped pumps at 10:35									

Sampling Data

Monitoring Well ID: 54MW2
Sample Collection Time: 10:37

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump: Grundfos
Peristaltic Pump:
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	Perchlorate	1	250ml, plastic, 4°C
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives	2	(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU): 7.01
Final Temperature (°C): 15.91
Final Conductivity (µs): 0.637
Final DO: 2.37
Final Turbidity: 2.19 ntu
Final ORP: 172
Date Completed: 9/19/07
Well Locked At: 10:54
Signature of Samplers:

MONITORING WELL INSPECTION LOG

PROJECT NAME: RFAAP-SWMU 84-Qtr 4

URS PROJECT NO. 11656351

FACILITY NAME: RFAAP

MONITORING WELL: 84MW3

A. Inspected by (full name): Christine DeVine

B. Date/Time of Inspection: 9/19/07 8:20

C. Inspection Observations:

1. Locking protective casing:
   carbener lock
2. Concrete well Pad:
   Intact
3. Lock:
   not present
4. Erosion:
   none visable
5. Exterior well identification number:
   not present

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:
replace lock + provide external numbers

F. Repair/remediation Date: _____

See MW-2

INITIAL CALIBRATION	FINAL CALIBRATION
DATE:	DATE:
TIME:	TIME:

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
4.0			

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER _____			

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

COMMENTS_____

SIGNATURE_____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	RFAAP-SWMU 97-Qtr 4	Date:	9/19/07
Facility Name:	RFAAP	Client:	RFAAP
URS Project No.:	11105635.1	Sampling Event:	GW 4th Qtr
Weather Conditions:	foggy / cloudy		
Sampling Team:	Jim Carter / Tina Deline		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	RFMW3	Organic Vapor Headspace:	— ppm
Time Well Casing Unlocked:	8:00	Combustible Gas:	— %LEL
Well Stickup from Ground Surface (Inner Casing):	1.22 ft		
Well Stickup from Ground Surface (Outer Casing):	1.46 ft	Height of Water H_w [a-b]	7.49 ft
Depth to Water Top of Inner/outer casing:[a]	24.84 ft		
Depth to Immiscible Layer	— ft	Measurement Technique:	
Thickness of Immiscible Layer	— ft	water level meter & tape measure	
Total Depth of Well From top of Inner/Outer Casing [b]:	32.33 ft		

Well Construction and Purge Volume Calculation

Screened Well [X]

Boring Radius (r_b)	ft
Nominal Radius of Casing (r_c)	ft
Height of Sand Pack (h_s)	ft
Length of Screen	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]
Low Flow Purge/Low Flow Sampling: [X]
Other:

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump:	[ ]		[ ]
Peristaltic Pump:	[X]		[ ]

Field Groundwater Monitoring Log

Project Information

Project Name:	RFAAP-SWMU 54-Qtr 4	Event:	GW 4th Qtr
Facility Name:	RFAAP	Date:	9/19/07
URS Project No.:	11656351	Facility	RFAAP
Weather Conditions:	Cool (~50°F), Foggy, Light Breeze (<5mph)	Well ID:	54MW3
Sampling Team:	Jim Carter / Tina DeVine		

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)
8:50	250	0	Clear	5.52	13.63	0.571	11.53	211	3.72
8:55	250	1250	Clear	5.58	13.92	0.571	9.15	188	3.20
9:00	250	2500	Clear	5.66	14.70	0.568	7.62	188	2.63
9:05	250	3,750	Clear	5.67	15.25	0.569	6.90	196	2.42
9:10	250	5,000	Clear	5.67	15.41	0.570	6.59	207	2.34
9:15	250	6250	Clear	5.67	15.54	0.570	6.38	205	2.18
Stopped purging at 9:15									

Sampling Data

Monitoring Well ID: 54MW3 Sample Collection Time: 9:18

Sampling Device:

Dedicated Bladder Pump:		Peristaltic Pump:	
Dedicated Submersible Pump:		Dedicated Bailer:	
Submersible Pump:	Grundfos	Disposable Bailer:	

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	perchlorate	1	250 ml, plastic, 4°C
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives	2	(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU)	5.67	Final Conductivity (µs):	0.570	Final Turbidity:	2.02 ntu
Final Temperature (°C)	15.60	Final DO:	6.34	Final ORP:	205
				Date Completed:	9/19/07
Well Locked At:	937	Signature of Samplers:			

MONITORING WELL INSPECTION LOG

PROJECT NAME: RFAAP-SWMU51-Qtr4

URS PROJECT NO. 11656351

FACILITY NAME: RFAAP

MONITORING WELL: 51MW4

A. Inspected by (full name): Christina DeVino

B. Date/Time of Inspection: 13:20 9/19/07

C. Inspection Observations:

1. Locking protective casing:
   no lock
2. Concrete well Pad:
   intact
3. Lock:
   not present
4. Erosion:
   none observed
5. Exterior well identification number:
   none

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:
replace lock & paint outside numbers

F. Repair/remediation Date: _____

See MW-2

INITIAL CALIBRATION	FINAL CALIBRATION
DATE:	DATE:
TIME:	TIME:

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
4.0			

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER _____			

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

COMMENTS_____

SIGNATURE_____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	RFAAP-SWMU91-Qtr 4	Date:	9/19/07
Facility Name:	RFAAP	Client:	RFAAP
URS Project No.:	11656351	Sampling Event:	GW 4th Qtr
Weather Conditions:			
Sampling Team:	Jim Carter/Tina DeVine		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	91MW4	Organic Vapor Headspace:	— ppm
Time Well Casing Unlocked:	1:03	Combustible Gas:	— %LEL
Well Stickup from Ground Surface (Inner Casing):	2.23 ft		
Well Stickup from Ground Surface (Outer Casing):	2.42 ft	Height of Water H_w [a-b]	30.59 ft
Depth to Water Top of (Inner)/outer casing:[a]	17.21 ft		
Depth to Immiscible Layer	— ft	Measurement Technique:	
Thickness of Immiscible Layer	— ft	water level meter & tape measure	
Total Depth of Well From top of (Inner)/Outer Casing [b]:	47.80 ft		

Well Construction and Purge Volume Calculation

Screened Well [X]

Boring Radius (r_b)	ft
Nominal Radius of Casing (r_c)	ft
Height of Sand Pack (h_s)	ft
Length of Screen	ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]

Low Flow Purge/Low Flow Sampling: [X]

Other:

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump:	[ ]		[ ]
Peristaltic Pump:	[X]		[ ]

Field Groundwater Monitoring Log

Project Information

Project Name: RFAAP - SWMU 54 - Qtr 4
Facility Name: RFAAP
URS Project No.: 11692351
Weather Conditions: Sunny
Sampling Team: Jim Carter / Tina DeVine

Event: GW 4th Qtr
Date: 9/19/07
Facility: RFAAP
Well ID: 54MW34

Purge Data

Purge Rate/Volume Units:
milliliters per minute [ ]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)
1320	250	—	clear	7.78	15.17	1.13	15.55	3	3.24
1325	250	1,250	clear	7.83	15.39	1.13	8.65	2	2.58
1330	250	2,500	clear	7.85	15.38	1.12	7.21	0	1.40
1335	250	3,750	clear	7.89	15.67	1.11	5.22	-1	0.92
1340	250	5,000	clear	7.91	15.83	1.10	4.39	-3	0.87
Stopped purging at 13:40									

Sampling Data

Monitoring Well ID: 54MW4
Sample Collection Time: 13:43

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)		1	
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives	2	(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU): 7.91
Final Temperature (°C): 16.08
Well Locked At: 13:56
Final Conductivity (µs): 1.10
Final DO: ~~1.10~~ 4.03
Signature of Samplers:
Final Turbidity: 0.43 ntu
Final ORP: ~1
Date Completed: 9/19/07

MONITORING WELL INSPECTION LOG

PROJECT NAME: RFAAP - SWMU 54 - Qtr 4

URS PROJECT NO. 11656351

FACILITY NAME: RFAAP

MONITORING WELL: 54MW5

A. Inspected by (full name): Christina DeVino

B. Date/Time of Inspection: 9/19/07 11:00

C. Inspection Observations:

1. Locking protective casing:
   no locks
2. Concrete well Pad:
   intact
3. Lock:
   not present
4. Erosion:
   none visable
5. Exterior well identification number:
   no exterior ID

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

see form 064MW2

INITIAL CALIBRATION	FINAL CALIBRATION
DATE:	DATE:
TIME:	TIME:

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
4.0			

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER _____			

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

COMMENTS_____

SIGNATURE_____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	RFAAP-SWMU54-Qtr 4	Date:	9/19/07
Facility Name:	RFAAP	Client:	RFAAP
URS Project No.:	11656351	Sampling Event:	Gw 4th Quarter
Weather Conditions:			
Sampling Team:	Jim Carter/Tina Devine		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	54MW5	Organic Vapor Headspace:	— ppm
Time Well Casing Unlocked:	10:56	Combustible Gas:	— %LEL
Well Stickup from Ground Surface (Inner Casing):	2.40 ft		
Well Stickup from Ground Surface (Outer Casing):	2.67 ft	Height of Water H_w [a-b]	6.37 ft
Depth to Water Top of (Inner)/Outer casing:[a]	19.49 ft		
Depth to Immiscible Layer	— ft	Measurement Technique:	
Thickness of Immiscible Layer	— ft	water level meter + tape measure	
Total Depth of Well From top of (Inner)/Outer Casing [b]:	25.86 ft		

Well Construction and Purge Volume Calculation

Screened Well [X]

Boring Radius (r_b)	ft
Nominal Radius of Casing (r_c)	ft
Height of Sand Pack (h_s)	ft
Length of Screen	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]
Low Flow Purge/Low Flow Sampling: [X]
Other:

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump:	[ ]		[ ]
Peristaltic Pump:	[X]		[ ]

Field Groundwater Monitoring Log

Project Information

Project Name: RFAAP-SWMU 54-Qtr 4
Facility Name: RFAAP
URS Project No.: 11656351
Weather Conditions: SUNNY
Sampling Team: Jim Carter/Tina DeVine

Event: GW 4th Qtr
Date: 9/19/07
Facility: RFAAP
Well ID: 54MW5

Purge Data

Purge Rate/Volume Units:
milliliters per minute [X]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)
1110	125	~~clear~~	clear	6.86	17.20	0.647	7.19	225	2.95
1115	125	625	clear	6.87	17.15	0.647	6.82	224	2.56
1120	125	1250	clear	6.87	17.07	0.647	6.42	220	1.67
1125	125	1875	clear	6.88	17.06	0.648	5.96	223	1.58
1130	125	2500	clear	6.89	17.27	0.646	5.62	226	~~2.57~~ 1.72

Sampling Data

Monitoring Well ID: 54MW5
Sample Collection Time: 11:35

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	Perchlorate	1	(125ml plastic, no preserv, 4°C
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives	2	(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU): 6.86
Final Temperature (°C): 17.26
Final Conductivity (µs): 0.647
Final DO: 5.53
Final Turbidity: 1.62 ntu
Final ORP: 228
Date Completed: 9/19/07

Well Locked At: 11:50
Signature of Samplers:

MONITORING WELL INSPECTION LOG

PROJECT NAME: RFAAP-SWMU 54-Qtr 4

URS PROJECT NO. 11656351

FACILITY NAME: RFAAP

MONITORING WELL: 54MW16

A. Inspected by (full name): Christina DeVivo

B. Date/Time of Inspection: 9/19/07 15:19

C. Inspection Observations:

1. Locking protective casing:
   lock is locked
2. Concrete well Pad:
   intact
3. Lock:
   working condition
4. Erosion:
   none visible
5. Exterior well identification number:
   no external ID

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

INITIAL CALIBRATION	FINAL CALIBRATION
DATE:	DATE: 9/19/07
TIME:	TIME: 16:51

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			~~5.09~~
10.0			
4.0			5.09

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
			4.31

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER ambient air			21.30

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
			13.6

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
			321

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
			7.72

COMMENTS_____

SIGNATURE_____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	RFAAP-SWMU 54 Qtr 4	Date:	9/19/07
Facility Name:	RFAAP	Client:	RFAAP
URS Project No.:	11656351	Sampling Event:	GW 4th Qtr
Weather Conditions:			
Sampling Team:	Jim Carter / Tina Devine		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	54MW16	Organic Vapor Headspace:	— ppm
Time Well Casing Unlocked:	3:15:00	Combustible Gas:	— %LEL
Well Stickup from Ground Surface (Inner Casing):	2.41 ft		
Well Stickup from Ground Surface (Outer Casing):	2.68 ft	Height of Water H_w [a-b]	4.97 ft
Depth to Water Top of Inner/outer casing:[a]	39.33 ft		
Depth to Immiscible Layer	— ft	Measurement Technique:	
Thickness of Immiscible Layer	— ft	water level meter & tape measure	
Total Depth of Well From top of Inner/Outer Casing [b]:	43.8 ft		

Well Construction and Purge Volume Calculation

Screened Well [X]

Boring Radius (r_b)	ft
Nominal Radius of Casing (r_c)	ft
Height of Sand Pack (h_s)	ft
Length of Screen	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]
Low Flow Purge/Low Flow Sampling: [X]
Other:

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump:	[ ]		[ ]
Peristaltic Pump:	[X]		[ ]

Field Groundwater Monitoring Log

Project Information

Project Name:	RFAAP - SWMU 54- Qtr 4	Event:	BW 4th Qtr
Facility Name:	RFAAP	Date:	9/19/07
URS Project No.:	11652e351	Facility	RFAAP
Weather Conditions:	Sunny	Well ID:	54MW6
Sampling Team:	Jim Carter / Tina Declue		

Purge Data

Purge Rate/Volume Units:
milliliters per minute [X]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)
1540	300	—	clear	8.17	15.20	0.328	11.46	108	73.3
1545	300	1,500	clear	8.13	16.77	0.324	8.86	141	51.0
1550	200	2,500	clear	8.12	17.37	0.322	8.30	160	48.8
1555	200	3,500	clear	8.09	17.77	0.317	7.32	189	34.9
1600	200	4,500	clear	8.09	18.97	0.316	6.84	197	25.7
1605	500	7,000	clear	8.15	16.18	0.300	7.53	185	21.5
1610	500	9,500	clear	8.15	16.84	0.299	6.69	201	17.47
1615	500	12,000	clear	8.14	16.24	0.284	8.17	199	15.91
16:20	500	14,500	clear	8.14	16.22	0.283	7.74	199	8.55
16:25	500	17,000	clear	8.14	16.46	0.276	7.59	219	5.08
16:24	500		clear	8.14	16.51	0.276	7.57	224	5.07
16:26	500		clear	8.14	16.52	0.276	7.55	228	5.06
16:28	500		clear	8.14	16.67	0.272	7.50	233	4.54
16:30	500		clear	8.13	16.71	0.270	7.48	235	4.38

EQBK-1 Collected at this location.

Stopped purging at 16:30

Sampling Data

Monitoring Well ID: 54MW6 Sample Collection Time: 16:35

Sampling Device:

Dedicated Bladder Pump: _____ Peristaltic Pump: _____
Dedicated Submersible Pump: _____ Dedicated Bailer: _____
Submersible Pump: X Disposable Bailer: _____

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	Perchlorate	1	(250ml plastic, no preserv 4°C)
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives	2	(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU)	8.13	Final Conductivity (µs):	0.267	Final Turbidity:	4.37 ntu
Final Temperature (°C)	16.69	Final DO:	7.47	Final ORP:	236
Well Locked At:	16:55	Signature of Samplers:		Date Completed:	

MONITORING WELL INSPECTION LOG

PROJECT NAME: RFAAP-SWMU54-Qtr4

URS PROJECT NO. 11656351

FACILITY NAME: RFAAP

MONITORING WELL: 54MW7

A. Inspected by (full name): Christina DeVino

B. Date/Time of Inspection: 9/19/07 12:45

C. Inspection Observations:

1. Locking protective casing:
   2402 keylock present + locked
2. Concrete well Pad:
   intact
3. Lock:
   intact + locked
4. Erosion:
   none visible
5. Exterior well identification number:
   no exterior ID

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

See MW2

INITIAL CALIBRATION	FINAL CALIBRATION
DATE:	DATE:
TIME:	TIME:

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
4.0			

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER _____			

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

COMMENTS_____

SIGNATURE_____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	RFAAP-SWMU54-Qtr 4	Date:	9/19/07
Facility Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657635.1	Sampling Event:	GW 4th Quarter
Weather Conditions:			
Sampling Team:	Jim Carter/Tim DeVine		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	54MW7	Organic Vapor Headspace:	– ppm
Time Well Casing Unlocked:		Combustible Gas:	– %LEL
Well Stickup from Ground Surface (Inner Casing):	31.65 ft		
Well Stickup from Ground Surface (Outer Casing):	31.88 ft	Height of Water H_w [a-b]	7.38 ft
Depth to Water Top of Inner/outer casing:[a]	25.15 ft		
Depth to Immiscible Layer	– ft	Measurement Technique:	
Thickness of Immiscible Layer	– ft	water level meter and hypermarine	
Total Depth of Well From top of Inner/Outer Casing [b]:	17.77 ft		

Well Construction and Purge Volume Calculation

Screened Well [X]

Boring Radius (r_b)	ft
Nominal Radius of Casing (r_c)	ft
Height of Sand Pack (h_s)	ft
Length of Screen	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]
Low Flow Purge/Low Flow Sampling: [X]
Other:

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump:	[ ]		[ ]
Peristaltic Pump:	[X]		[ ]

Field Groundwater Monitoring Log

Project Information

Project Name:	RFAAP-SWMU 54-Qtr 4	Event:	GW 4th Qtr
Facility Name:	RFAAP	Date:	9/19/07
URS Project No.:	11656351	Facility	RFAAP
Weather Conditions:		Well ID:	54MW7
Sampling Team:	Jim Carter / Tina DeVine		

Purge Data

Purge Rate/Volume Units:

milliliters per minute [X]

gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)
1210	200	0	clear	6.91	17.04	0.765	9.59	271	1.75
1215	200	1,000	clear	6.91	16.91	0.765	7.68	270	0.95
1220	200	2,000	clear	6.97	16.58	0.766	5.42	268	0.61
1225	200	3,000	clear	7.06	17.28	0.765	5.59	269	0.55
1230	200	4,000	clear	6.98	16.87	0.766	4.76	267	0.35
Stopped purging at 1230									

DUP-1 collected at this well location.

Sampling Data

Monitoring Well ID: 54MW7

Sample Collection Time: 1232

Sampling Device:

Dedicated Bladder Pump:		Peristaltic Pump:	X
Dedicated Submersible Pump:		Dedicated Bailer:	
Submersible Pump:		Disposable Bailer:	

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	Perchlorate	1	(250ml plastic, no pres., 4°C)
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives	2	(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU)	6.97	Final Conductivity (µs):	0.766	Final Turbidity:	0.39 ntu
Final Temperature (°C)	16.83	Final DO:	4.56	Final ORP:	266
				Date Completed:	9/19/07
Well Locked At:	1:01	Signature of Samplers:			

MONITORING WELL INSPECTION LOG

PROJECT NAME: RFAAP-SWMU54-Qtr 4

URS PROJECT NO. 11656351

FACILITY NAME: RFAAP

MONITORING WELL: 54MW8

A. Inspected by (full name): Christina DeVine

B. Date/Time of Inspection: 9/18/07 15:31

C. Inspection Observations:

1. Locking protective casing:
   lock present but rusted
2. Concrete well Pad:
   intact
3. Lock:
   rusted
4. Erosion:
   none
5. Exterior well identification number:
   not available

D. Inspection Comments:
   ~~well pad covered with growth~~

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:
replace lock and provide outside numbering

F. Repair/remediation Date: _____

see daily sheet for SHMW9

INITIAL CALIBRATION	FINAL CALIBRATION
DATE:	DATE:
TIME:	TIME:

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
4.0			

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER _____			

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

COMMENTS_____

SIGNATURE_____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	RFAAP-SWMU54-Qtr 4	Date:	9/18/07
Facility Name:	RFAAP	Client:	RFAAP
URS Project No.:	11656351	Sampling Event:	GW 4th Quarter
Weather Conditions:	sunny		
Sampling Team:	Jim Carter / Tina DeVine		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	54MW8		Organic Vapor Headspace:	— ppm
Time Well Casing Unlocked:			Combustible Gas:	— %LEL
Well Stickup from Ground Surface (Inner Casing):	2.16	ft		
Well Stickup from Ground Surface (Outer Casing):	1.75	ft	Height of Water H_w [a-b]	15.68 ft
Depth to Water Top of Inner/Outer casing:[a]	15.70	ft		
Depth to Immiscible Layer	—	ft	Measurement Technique:	
Thickness of Immiscible Layer	—	ft	water level meter and tape measure	
Total Depth of Well From top of Inner/Outer Casing [b]:	31.38	ft		

Well Construction and Purge Volume Calculation

Screened Well [ ]

Boring Radius (r_b)	ft
Nominal Radius of Casing (r_c)	ft
Height of Sand Pack (h_s)	ft
Length of Screen	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]
Low Flow Purge/Low Flow Sampling: [X]
Other:

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump:	[ ]		[ ]
Peristaltic Pump:	[X]		[ ]

Field Groundwater Monitoring Log

Project Information

Project Name:	RFAAP-SWMU54-Qtr 4	Event:	GW 4th Qtr
Facility Name:	RFAAP	Date:	9/18/07
URS Project No.:	11656351	Facility	RFAAP
Weather Conditions:	Sunny	Well ID:	54MW8
Sampling Team:	Jim Carter/Tina DeVito		

Purge Data

Purge Rate/Volume Units:
milliliters per minute [X]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)
1505	200	0	clear	6.78	14.89	0.711	5.72	277	1.59
1510	200	1,000	clear	6.78	14.73	0.712	5.19	280	1.07
1515	200	2,000	clear	6.79	14.56	0.712	4.75	282	0.89
1520	200	3,000	clear	6.80	14.60	0.711	4.23	285	0.76
1525	200	4,000	clear	6.82	14.52	0.712	4.09	287	0.59
Stopped purging at 15:26.									

Sampling Data

Monitoring Well ID: 54MW8
Sample Collection Time: 15:30

Sampling Device:

Dedicated Bladder Pump:		Peristaltic Pump:	X
Dedicated Submersible Pump:		Dedicated Bailer:	
Submersible Pump:		Disposable Bailer:	

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	Perchlorate	1	(250ml, plastic, no preserv, 4°C)
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives	2	(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU)	~~4.06~~	Final Conductivity (µs):	0.711	Final Turbidity:	0.43 ntu
Final Temperature (°C)	14.41	Final DO:	4.06	Final ORP:	~~285~~
Well Locked At:	15:40	Signature of Samplers:		Date Completed:	9/18/07

MONITORING WELL INSPECTION LOG

PROJECT NAME: KFAAP-SWMU 54-Qtr 4

URS PROJECT NO. 11656351

FACILITY NAME: KFAAP

MONITORING WELL: 54MW9

A. Inspected by (full name): Christina DeVino

B. Date/Time of Inspection: 9/18/07 13:00

C. Inspection Observations:

1. Locking protective casing:
   lock in place but needs to be replaced
2. Concrete well Pad:
   intact
3. Lock:
   rusted
4. Erosion:
   none observed
5. Exterior well identification number:
   not identified

D. Inspection Comments:

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:
replace lock & add external ID

F. Repair/remediation Date: _____

INITIAL CALIBRATION	FINAL CALIBRATION
DATE: 9/18/07	DATE: 9/18/07
TIME: 13:07	TIME: 18:20

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: Auto Cal soln (pH 4.00 0.0 NTU 4.49 mS/cm)

METER ID Horiba - Model U-22XD MFG No 3033006

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0	~~7~~		
10.0			
4.0	4.04	4.00	4.02

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: see pH info

METER ID see pH info

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
4.49	4.43	4.51	4.48

TEMPERATURE METER CALIBRATION

METER ID see pH info

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER std temp ambient air	22.39	22.11	22.51

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: see pH info

METER ID see pH info

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
0	1.2	0.0	0.1

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: see pH info

METER ID see pH info

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
-	293	293	293

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO: see pH info

METER ID see pH info

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
-	10.25	8.70	8.97

COMMENTS _____

SIGNATURE _____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	RFAAP-SWMU54-Qtr 4	Date:	9/18/07
Facility Name:	RFAAP	Client:	RFAAP
URS Project No.:	11605e351	Sampling Event:	GW 4th Quarter
Weather Conditions:	sunny		
Sampling Team:	Jim Carter/Tina Destine		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	54MW9	Organic Vapor Headspace:	— ppm
Time Well Casing Unlocked:	12:52	Combustible Gas:	— %LEL
Well Stickup from Ground Surface (Inner Casing):	23.56" = ft 1.96'		
Well Stickup from Ground Surface (Outer Casing):	20.75" = 1.73 ft 1.73	Height of Water H_w [a-b]	7.57 ft
Depth to Water Top of Inner/outer casing:[a]	20.32 ft		
Depth to Immiscible Layer	— ft	Measurement Technique:	
Thickness of Immiscible Layer	— ft	water level meter & tape measure	
Total Depth of Well From top of Inner/Outer Casing [b]:	27.89 ft		

Well Construction and Purge Volume Calculation

Screened Well [ ]

Boring Radius (r_b)	ft
Nominal Radius of Casing (r_c)	ft
Height of Sand Pack (h_s)	ft
Length of Screen	ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]

Low Flow Purge/Low Flow Sampling: [X]

Other:

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump:	[ ]		[ ]
Peristaltic Pump:	[X]		[ ]

TD = 28.5
Tubing depth
23.5 Ft BTOC

Field Groundwater Monitoring Log

Project Information

Project Name: RFAAP-SWMU 54-Qtr 4
Facility Name: RFAAP
URS Project No.: 11656351
Weather Conditions: sunny
Sampling Team: Jim Carter/Tina DeVine

Event: GW 4th Qtr
Date: 9/18/07
Facility: RFAAP
Well ID: 54MW9

Purge Data

Purge Rate/Volume Units:
milliliters per minute
gallons per minute
[ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)
1336 ~~1336~~	125	0	Clear	7.02	20.25	0.839	6.04	224	3.73
1338	125	250	Clear	7.04	19.35	0.836	5.40	230	2.42
1340	125	500	Clear	7.05	18.86	0.835	5.05	234	~~1.18~~
1345	125	1125	Clear	7.05	18.69	0.834	4.25	234	1.18
1350	125	1750	Clear	7.07	18.79	0.834	4.38	234	1.56
1355	125	2375	Clear	7.09	18.82	0.834	3.88	235	1.70
1400	125	3000	Clear	7.10	18.97	0.833	3.69	237	3.09
Stopped pumping at 14:02									

Turned pump on at 13:36
took 5-6min to get flow rate measured

Sampling Data

Monitoring Well ID: 54MW9
Sample Collection Time: 14:05

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X Solinst Model 410
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	Perchlorate	1	(250ml, plastic, nopres. 4°C)
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives	2	(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No

Final pH (SU): 7.11
Final Temperature (°C): 18.95
Final Conductivity (µs): 0.837
Final DO: 3.78
Final Turbidity: 2.19 ntu
Final ORP: 237
Date Completed: 9/18/07

Well Locked At: 14:28
Signature of Samplers:

MONITORING WELL INSPECTION LOG

PROJECT NAME: RFAAP - SWMU 54 - Qtr 4

URS PROJECT NO. 11656351

FACILITY NAME: RFAAP

MONITORING WELL: 54MW10

A. Inspected by (full name): Christina DeVine

B. Date/Time of Inspection: 9/18/07 16:30

C. Inspection Observations:

1. Locking protective casing:
   lock present but rusted
2. Concrete well Pad:
   intact
3. Lock:
   rusted
4. Erosion:
   none
5. Exterior well identification number:
   not present

D. Inspection Comments:
well pad covered with grass

MONITORING WELL INSPECTION LOG

E. Repair/remediation comments:

_____

_____

_____

_____

F. Repair/remediation Date: _____

Daily Calibration Form

See MW-9

INITIAL CALIBRATION	FINAL CALIBRATION
DATE:	DATE:
TIME:	TIME:

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
4.0			

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER _____			

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

ORP METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

COMMENTS_____

SIGNATURE_____

GROUNDWATER SAMPLING FIELD LOG

Project Information

Project Name:	RFAAP-SWMU54-Qtr 4	Date:	9/18/07
Facility Name:	RFAAP	Client:	RFAAP
URS Project No.:	11656351	Sampling Event:	GW 4th Quarter
Weather Conditions:	Sunny		
Sampling Team:	Jim Carter / Tina DeVine		

Monitoring Well ID and Measurement Information

Monitoring Well ID:	54MW10	Organic Vapor Headspace:	— ppm
Time Well Casing Unlocked:	16:00	Combustible Gas:	— %LEL
Well Stickup from Ground Surface (Inner Casing):	2.64 ft		
Well Stickup from Ground Surface (Outer Casing):	2.20 ft	Height of Water H_w [a-b]	12.54 ft
Depth to Water Top of Inner/outer casing:[a]	17.48 ft		
Depth to Immiscible Layer	— ft	Measurement Technique:	
Thickness of Immiscible Layer	— ft	water level meter + tape measure	
Total Depth of Well From top of Inner/Outer Casing [b]:	30.02 ft		

Well Construction and Purge Volume Calculation

Screened Well [ ]

Boring Radius (r_b)	ft
Nominal Radius of Casing (r_c)	ft
Height of Sand Pack (h_s)	ft
Length of Screen	ft

Formulas for Determining Purge Volume

Water Level above Top of Sand Pack

$3 \times [\pi r_b^2 h_s - \pi r_c^2 h_s) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

Water Level below Top of Sand Pack

$3 \times [\pi r_b^2 h_w - \pi r_c^2 h_w) \times 0.3 + (\pi r_c^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft
r_b = radius of boring	ft
r_c = radius of casing	ft
h_s = height of sand	ft
h_w = height of water	ft

Purge/Sampling Technique:

High Flow-Volume Purge/Low Flow Sampling: [ ]

Low Flow Purge/Low Flow Sampling: [X]

Other:

Open Bedrock Well [ ]

Radius of Open Borehole (r_b)	ft
Depth to Bottom of Overburden Casing	ft
Depth to Bottom of Well	ft
Length of Well Open to Bedrock	ft

Formula for Determining Purge Volume:

$3 \times [(\pi r_b^2 h_w) \times 7.5] =$ _____ gals

where:

r_b = radius of boring	ft
h_w = height of water	ft
r_b = radius of boring	ft
h_w = height of water	ft

Purge Equipment

Dedicated Bladder Pump:	[ ]	Dedicated Bailer:	[ ]
Dedicated Submersible Pump:	[ ]	Disposable Bailer:	[ ]
Submersible Pump:	[ ]		[ ]
Peristaltic Pump:	[X]		[ ]

Field Groundwater Monitoring Log

Project Information

Project Name: RFAAP-SWMU 91 - Qtr 4
Facility Name: RFAAP
URS Project No.: 11056351
Weather Conditions: sunny
Sampling Team: Jim Carter / Tina DeVine

Event: GW 4th Qtr
Date: 9/18/07
Facility: RFAAP
Well ID: 54MW10

Purge Data

Purge Rate/Volume Units:
milliliters per minute [X]
gallons per minute [ ]

Time	Rate	Volume	Appearance	pH (SU)	Temp (°C)	Cond (ms)	DO (mg/L)	ORP (mV)	Turbidity (ntu)
1610	250	0	clear	6.97	15.88	0.929	7.41	236	26.0
1615	250	1250	clear	6.91	15.88	0.929	7.08	234	24.5
1620	250	2500	clear	6.80	15.77	0.887	5.54	218	17.22
1625	250	3750	clear	6.74	16.06	0.849	4.75	227	14.05
1630	250	5000	clear	6.74	16.47	0.849	3.90	235	10.07
1635	250	6250	clear	6.75	16.96	0.844	3.84	238	7.47
~~1640~~	~~250~~								
stopped pumping			1637						

Sampling Data

Monitoring Well ID: 54MW10
Sample Collection Time: 16:40

Sampling Device:
Dedicated Bladder Pump:
Dedicated Submersible Pump:
Submersible Pump:
Peristaltic Pump: X
Dedicated Bailer:
Disposable Bailer:

Sample Containers/Preservatives

VOCs		(40 ml, gl. Vial, HCL pH<2, 4°C)	Metals (UF)		(1 liter, plastic HNO_3, pH<2, 4°C)
SVOCs		(1 liter, amber glass, 4°C)	Metals (F)		(1 liter, plastic HNO_3, pH<2, 4°C)
Pesticides		(1 liter, amber glass, 4°C)	Sulfide		(250 ml, plastic, ZnAC+NaOH, pH>9, 4°C)
Herbicides		(1 liter, amber glass, 4°C)	Perchlorate	1	(250ml, plastic, nopres, 4°C)
PCBs		(1 liter, amber glass, 4°C)			
PAHs		(1 liter, amber glass, 4°C)			
Explosives	2	(1 liter, amber glass, 4°C)			
Perchlorate		(125 ml, plastic, 4°C)			
Dioxin/Furans		(1 liter, amber glass, 4°C)			
Cyanide		(250 ml, plastic, NaOH, pH>12, 4°C)			

Comments:

Field Filtering of Metals with 0.45 µ Disposable Filter [ ]Yes [ ]No
Final pH (SU): 6.76
Final Temperature (°C): 17.27
Final Conductivity (µs): 0.844
Final DO: 3.86
Final Turbidity: 7.19 ntu
Final ORP: 239
Date Completed: 9/18/07
Well Locked At: 5:00 17:00
Signature of Samplers:

APPENDIX C.6

SAMPLE LOCATION COORDINATES AND ELEVATIONS

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Table C.6-1
Sample Coordinates - Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Boring	Coordinates		Elevation
	Northing	Easting	Ground Surface (msl)
Area A			
54SB3	3602114.26	10895619.24	--
54SB10	3602183.40	10895655.46	--
54SB17	3602262.25	10895715.18	1696.35
54SB18	3602252.05	10895753.85	1698.98
54SB19	3602223.57	10895704.98	1696.15
54SB20	3602213.38	10895743.66	1698.88
54SB21	3602195.09	10895656.12	1696.04
54SB22	3602184.90	10895694.79	1696.98
54SB23	3602174.71	10895733.46	1699.31
54SB24	3602156.42	10895645.92	1696.17
54SB25	3602146.22	10895684.60	1696.66
54SB26	3602136.03	10895723.27	1698.88
54SB27	3602117.74	10895635.73	1696.56
54SB28	3602107.55	10895674.40	1697.68
54SB29	3062565.62	10897129.49	1698.88
54SB30	3602079.17	10895625.34	1696.76
54SB31	3602068.88	10895664.21	1697.87
54SB32	3602058.68	10895702.89	1699.07
54SB33	3602030.20	10895654.02	1696.44
54SB34	3602020.01	10895692.69	1698.03
54SB35	3602050.59	10895576.67	1696.63
54SB36	3602127.94	10895597.06	1696.31
54SB37	3602019.71	10895581.27	1696.09
54SB38	3601983.79	10895641.79	1696.31
54SB56	3602022.42	10895828.59	1685.05
54SB57	3602072.61	10895653.59	1697.03
54SB58	3602062.75	10895747.59	1700.43
54SB59	3602074.60	10895810.03	1688.97
54SB60	3602073.47	10895877.59	1693.89
54SB61	3602149.04	10895763.02	1702.06
54SB62	3602154.77	10895815.33	1700.91
54SB63	3602165.50	10895854.51	1692.13
54SB64	3602164.58	10895877.48	1694.40
54SB65	3602212.06	10895816.21	1701.31
54SB66	3602212.95	10895865.34	1692.12
54SB67	3602223.63	10895900.26	1711.14
54SB68	3602299.07	10895813.73	1701.11
54SB69	3602306.03	10895883.85	1690.61
54SB70	3602389.35	10895863.26	1711.68
54SB81	3601984.68	10895736.45	--
54SB82	3602040.49	10895724.76	--
54SB83	3602188.53	10895761.41	--
54SB84	3602097.59	10895586.79	--
54MW5	3602215.01	10895601.44	1695.72
54MW-8	3602211.14	10895601.34	1688.90
54MW-9	3602464.31	10895849.83	1694.11
54MW-10	3602012.49	10895859.27	1690.07

Table C.6-1
Sample Coordinates - Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Boring	Coordinates		Elevation
	Northing	Easting	Ground Surface (msl)
Area B			
54SB39	3602415.70	10895439.24	1700.91
54SB40	3602415.70	10895499.23	1697.44
54SB41	3602475.69	10895379.25	1704.70
54SB42	3602475.69	10895439.36	1700.79
54SB43	3602475.69	10895499.23	1696.54
54SB44	3602535.69	10895379.25	1704.00
54SB45	3602535.69	10895439.24	1700.94
54SB46	3602533.75	10895499.23	1698.14
54SB47	3602535.69	10895559.22	1694.02
54SB48	3602595.37	10895439.24	1701.60
54SB49	3602595.68	10895499.23	1697.67
54SB50	3602595.68	10895559.22	1694.08
54SB51	3602455.70	10895399.24	1702.91
54SB52	3602515.69	10895339.25	1711.06
54SB53	3602495.69	10895559.22	1695.28
54SB54	3602595.68	10895419.24	1701.88
54SB55	3602635.67	10895499.23	1697.57
54SB71	3602496.44	10895561.97	1695.82
54SB72	3602472.76	10895504.67	1696.53
54SB73	3602536.52	10895565.75	1694.47
54SB74	3602597.01	10895563.67	1694.41
54SB75	3602534.78	10895440.71	1701.65
54SB76	3602530.31	10895500.44	1697.45
54SB77	3602703.53	10895497.43	--
54SB78	3602654.83	10895441.72	--
54SB79	3602669.51	10895498.19	--
54SB80	3602649.19	10895556.55	--
54MW4	3602558.11	10895625.67	1693.72
54MW6	3602505.43	10895234.04	1736.74
54MW7	3602457.87	10895608.99	1694.15
VI Borings			
54MW1	3602191.70	10895353.65	1704.47
54MW1A	3602162.05	10895354.01	1704.04
54MW2	3602110.65	10895709.15	1697.82
54MW3	3602204.62	10895761.92	1699.58

Notes:
bgs = Below ground surface
msl = Mean sea level
Coordinate System is Virginia State Plane South. Units are in feet.

Table C.6-2
Sample Coordinates - Sediment
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID	Coordinates		Elevation
	Northing	Easting	Ground Surface (msl)
Sediment Locations			
NR-SED-1	3599585.344	10885249.806	--
NR-SED-2	3600033.451	10886509.114	--
NR-SED-3	3600459.465	10888792.461	--
NR-SED-4	3600913.807	10888365.271	--
NR-SED-5	3600391.079	10890085.847	--
NR-SED-6	3599916.895	10890965.854	--
NR-SED-7	3600100.324	10891843.843	--
NR-SED-8	3599305.412	10892587.511	--
NR-SED-9	3599862.320	10893505.886	--
NR-SED-10	3599970.136	10894139.449	--
NR-SED-11	3600034.680	10894432.178	--
NR-SED-12	3600168.277	10894807.311	--
NR-SED-13	3600526.231	10895098.216	--
NR-SED-14	3601835.611	10895838.344	--
NR-SED-15	3602269.019	10895912.338	--
NR-SED-16	3604886.487	10895086.258	--
NR-SED-17	3604876.993	10894584.382	--
NR-SED-18	3605055.004	10893358.289	--
NR-SED-19	3604994.049	10891957.151	--
NR-SED-20	3604770.512	10890592.958	--
NR-SED-21	3602803.952	10881924.264	--
NR-SED-22	3601376.785	10880573.949	--
NR-SED-23	3601531.291	10880447.852	--

Notes:
bgs = Below ground surface
msl = Mean sea level
Coordinate System is Virginia State Plane South. Units are in feet.

Table C.6-3
Sample Coordinates - Surface Water/Sediment Pore Water
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sampling Location	Coordinates		Elevation
	Northing	Easting	Ground Surface (msl)
NR-SW/PW-1	3602479.094	10895962.640	--
NR-SW/PW-2	3602386.333	10895952.300	--
NR-SW/PW-3	3602306.527	10895951.582	--
NR-SW/PW-4	3602252.251	10895938.452	--
NR-SW/PW-5	3602207.388	10895935.085	--
NR-SW/PW-6	3602150.092	10895934.649	--
NR-SW/PW-7	3602051.153	10895916.634	--
NR-SW/PW-8	3602024.710	10895903.777	--
NR-SW/PW-9	3601932.491	10895892.101	--
NR-SW/PW-10	3601828.442	10895849.735	--

Notes:
msl = Mean sea level
Coordinate System is Virginia State Plane South. Units are in feet.

APPENDIX C.7

INVESTIGATION-DERIVED MATERIAL ANALYTICAL RESULTS

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SW-846

COVER PAGE - GENERAL CHEMISTRY ANALYSES DATA PACKAGE

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SOW No.: SDG No.: S2797

EPA Sample No.	Lab Sample ID.
54IDMH20	S2797-1

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: Paul Cvetich

Date: 12-26-02 Title: Data Reviewer

CompuChem
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Notification Regarding Manual Editing/Integration Flags

In some instances, manual adjustments to the software output are necessary to provide accurate data. These manual integrations are performed by the data reviewers, GC/MS operators, or GC chemists. An Extracted Ion Current Profile (EICP) or a GC chromatographic peak has been provided for the manual integration performed on each compound to demonstrate the accuracy of that process. The manual integrations are flagged on the quantitation report in the far right column beyond the FINAL concentration for GC/MS analysis, and in the "Flags" column for GC analysis. The manual editing/integration flags are:

M - Denotes that a manual integration has been performed for this compound. The manual integration was performed in order to provide the most accurate area count possible for the peak.

H - Denotes that a data reviewer, GC/MS operator, or GC Chemist has chosen an alternate peak within the retention time window from that chosen by the software for that compound. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

MH - Denotes that an alternate peak has been chosen within the retention time window from that chosen by the software for that compound and also a manual integration of the chosen peak has been performed. The manual integration was performed in order to provide the most accurate area count possible for the peak.

L - Denotes that a data reviewer or GC/MS operator has selected an alternate library search. This is typically done when an additional tentatively identified compound (TIC) has been added to the number of peaks searched. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

ML - Denotes that an alternate library search has been selected and a manual integration has also been performed. This is typically done when an additional TIC has been added and the TIC peak also required a manual integration.

The EPA CLP SOW documents require additional explanations for manual editing/integration. In the accompanying raw data packages, additional codes have been applied to the "M" flag and carry the following meanings;

M1 - The compound was initially not found by the automatic integration routine.

M2 - The compound was incorrectly integrated by the automatic integration routine.

M3 - The co-eluting compounds were incorrectly integrated by the automatic integration routine.

These codes will appear in the GC/MS and GC data packages.

Robert E. Meierer

Robert E. Meierer
Vice President

DATA REPORTING QUALIFIERS (continued)

C : This flag applies to GC or HPLC results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, this flag is not applied; a laboratory-defined flag is used instead (see the X/Y/Z qualifier.)

B : This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. This flag is used for a TIC as well as for a positively identified target compound. The combination of flags BU or UB is not an allowable policy. Blank contaminants are flagged with a B only when they are detected in the sample.

E : This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis. If one or more compounds have a response greater than the upper level of the calibration range, the sample or extract will be diluted and reanalyzed. All such compounds with a response greater than the upper level of the calibration range will have the concentration flagged with an E on the Form I for the original analysis.

D : If a sample or extract is reanalyzed at a higher dilution factor, for example when the concentration of an analyte exceeds the upper calibration range, the DL suffix is appended to the sample number on the Form I for the more diluted sample, and **all** reported concentrations on that Form I are flagged with the D flag. This flag alerts data users that any discrepancies between the reported concentrations may be due to dilution of the sample or extract.

NOTE 1: The D flag is not applied to compounds that are not detected in the sample analysis i.e., compounds reported with the CRQL (or Reporting Limit) and the U flag.

NOTE 2: Separate Forms I are used for reporting the original analysis (Client Sample No. XXXXX) and the more diluted sample analysis (Client Sample No. XXXXXDL) i.e., the results from both analyses are not combined on a single Form I.

A : This flag indicates that a TIC is a suspected aldol-condensation product.

X/Y/Z : Other specific flags may be required to properly define the results. If used, the flags will be fully described in the SDG Narrative. The laboratory-defined flags are limited to X, Y and Z.

DATA REPORTING QUALIFIERS

On the Form I, under the column labeled "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. Up to five qualifiers may be reported on Form I for each compound. The qualifiers used are:

U : This flag indicates the compound was analyzed for but not detected. The Contract Required Quantitation Limit (CRQL), or reporting limit, will be adjusted to reflect any dilution and, for soils, the percent moisture.

J : This flag indicates an estimated value. The flag is used as detailed below:

1. When estimating a concentration for tentatively identified compounds (TICs) where a response factor of 1.0 is assumed for the TIC analyte,

2. When the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL (or Reporting Limit) but greater than zero, and

3. When the retention time data indicate the presence of a compound that meets the pesticide/Aroclor or other GC or HPLC identification criteria, and the result is less than the CRQL (or Reporting Limit) but greater than zero. For example, if the CRQL (or Reporting Limit) is 10 µg/L, but a concentration of 3 µg/L is calculated, it is reported as 3J.

N : This flag indicates presumptive evidence of a compound. This flag is only used for TICs, where the identification is based on a mass spectral library search. For generic characterization of a TIC such as 'chlorinated hydrocarbon', the N flag is not used.

P : In the EPA's Contract Laboratory Program (CLP), this flag is used for a pesticide/Aroclor target analyte, when there is greater than a 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a P.
For SW-846 GC and HPLC analyses, when the Relative Percent Difference (RPD) is greater than 40% and there is no evidence of chromatographic anomalies or interferences, then the higher of the two values is reported and flagged with a P. When the RPD is equal to or less than 40%, our policy is to also report the higher of the two values, although the choice could be a project specific issue.

CompuChem

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Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE
SDG #S2797

SAMPLE IDENTIFICATIONS: 54IDMH20

The one water sample listed above was received intact, at 4.6 degrees C, with proper documentation, in sealed shipping containers, on December 13, 2002, and was scheduled for volatile TCLP, metals TCLP, semivolatile TCLP, herbicide TCLP, pesticide TCLP, reactive cyanide, reactive sulfide, and corrosivity analysis.
The volatile fraction sample was prepared by ZHE extraction, and analyzed following SW846 Method 8260B. All pertinent Quality Assurance Notices are included in the narrative section, and all pertinent Laboratory Notices SDG # S2797 are included in the sample data sections. Analysis holding time requirements were met this sample.

No target analytes were identified in the submitted sample above the reporting limits.

No searches were conducted for Tentatively Identified Compounds (TICs) per client request.

All Bromofluorobenzene (BFB) abundance criteria were met for tunes associated to this SDG. Overall QC criteria were met for all initial and continuing calibration standards associated to this SDG.

All of the system monitoring compounds(SMCs) met recovery criteria in the analysis of this sample, and all of the internal standards met response and retention time criteria in the analysis of this sample.

The associated method blank, and ZHE blank met all QC criteria, and did not contain any target analytes above the reporting limits.

The duplicate matrix spikes generated from this original met all QC precision and accuracy criteria without exception. The associated Laboratory Control Sample(LCS) met all accuracy criteria.

Manual quantitations were performed on the process files in the associated initial and continuing calibration(s). The reasons have been coded with explanations provided in the notice included in the narrative section of this SDG.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Roy Sutton
Case Reviewer
December 24, 2002

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMH20

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2797

Matrix: (soil/water) WATER Lab Sample ID: S2797-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: S2797-1A59

Level: (low/med) LOW Date Received: 12/13/02

% Moisture: not dec. _____ Date Analyzed: 12/23/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	25	U
75-35-4	1,1-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	7	J
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
127-18-4	Tetrachloroethene	25	U
108-90-7	Chlorobenzene	25	U

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SDG NARRATIVE

SDG # S2797
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS: 54IDMH20.

The one leachate sample listed above was received intact, properly refrigerated at 4.6°C, with proper documentation, in sealed shipping containers, on December 13, 2002. The samples were scheduled for the requested analyses of the semivolatile fraction. This portion of the SDG narrative deals with the semivolatile fractions only. SW-846, 3rd Edition, Update 3, the Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311), Separatory Funnel extraction (Method 3510C), and Method 8270C were used to prepare and analyze this sample, with the exceptions and/or additions requested by the client. All pertinent Quality Assurance Notices are included in the narrative section, and all pertinent Laboratory Notices for SDG # S2797 are included in the sample data sections. Extraction and analysis holding time requirements were met for this sample.

There were no semivolatile project analytes identified above the Quantitation Limit (QL) in this sample. Manual quantitations were performed on one or more of the process files associated with this SDG. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

All decafluorotriphenylphosphine (DFTPP) abundance criteria were met for tunes associated to this SDG. Tailing factor criteria were met for pentachlorophenol and benzidine. The breakdown criterion was met for DDT. These three compounds have been added to the DFTPP solution and analyzed together. Overall QC criteria were met for all initial and continuing calibration standards associated to this SDG. All of the surrogates met recovery criteria in the analysis of this sample. All of the internal standards met response and retention time criteria in the analysis of this sample. The associated method blank met all quality control criteria. 54IDMH20 was used as the original to prepare the duplicate matrix spikes. The associated duplicate matrix spikes met all advisory accuracy criteria. Most of the advisory precision criteria were not met in the comparison of the duplicate matrix spikes. The associated Laboratory Control Sample (LCS) met all accuracy criteria.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Rebecca K Mead

Rebecca K. Mead
Supervisor, GC/MS SVOA
December 26, 2002

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMH20

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2797

Matrix: (soil/water) WATER Lab Sample ID: S2797-1

Sample wt/vol: 100 (g/mL) ML Lab File ID: S2797-1B60

Level: (low/med) LOW Date Received: 12/13/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/17/02

Concentrated Extract Volume: 500(uL) Date Analyzed: 12/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	50	U

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SDG NARRATIVE
SDG # S2797
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS:
54IDMH20

The one water sample listed above was received intact, properly refrigerated, with proper documentation, in sealed shipping containers, on December 13, 2002. The sample was scheduled for the requested analyses of the herbicide fraction. SW-846, 3rd Edition, Update 3, the Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311), and Method 8081A were used to prepare and analyze these samples, with the exceptions and/or additions requested by the client. This portion of the SDG narrative deals with the pesticide fraction only. All pertinent Quality Assurance notices are included in the narrative section and all pertinent Laboratory notices for SDG # S2797 are included in the sample data sections.

Pesticide

Extraction and analysis holding time requirements were met for this sample. There is target analyte confirmed by dual column analysis above the Quantitation Limit in this sample. Manual quantitations were performed on one or more of the process files associated with this SDG, including 54IDH20. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

All QC criteria were met for all initial and continuing calibration standards associated to this SDG. The surrogates DCB and TCX were flagged as an outlier in the sample and in the matrix spike duplicate prepared from it. DCB was flagged as an outlier in the matrix spike.

The associated method blank met all quality control criteria.

54IDMH20 was used as the original to prepare the duplicate matrix spikes as requested. The recovery of the spike compound toxaphene was flagged as an outlier in the matrix spike and matrix spike duplicate. The Relative Percent Difference (RPD) of gamma-BHC, heptachlor, heptachlor epoxide, and toxaphene were flagged as an outlier in the comparison of the duplicate matrix spikes. The associated Laboratory Control Sample (LCS) met all accuracy criteria.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Elsie S. Byrd
Senior Scientist I
December 24, 2002

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMH20

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2797

Matrix: (soil/water) WATER Lab Sample ID: S2797-1

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:12/17/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/18/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

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Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE
SDG # S2797
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS:
54IDMH20

The one water sample listed above was received intact, properly refrigerated, with proper documentation, in sealed shipping containers, on December 13, 2002. The sample was scheduled for the requested analyses of the herbicide fraction. SW-846, 3rd Edition, Update 3, the Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311), and Method 8151A were used to prepare and analyze these samples, with the exceptions and/or additions requested by the client. This portion of the SDG narrative deals with the herbicide fraction only. All pertinent Quality Assurance notices are included in the narrative section and all pertinent Laboratory notices for SDG # S2797 are included in the sample data sections.

Herbicide

Extraction and analysis holding time requirements were met for this sample. 2,4-D and silvex were not confirmed by dual column analysis above the Quantitation Limit in this sample. Manual quantitations were performed on one or more of the process files associated with this SDG, including 54IDH20. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

All QC criteria were met for all initial and continuing calibration standards associated to this SDG. All of the surrogates met recovery and retention time criteria in the analyses of these samples.

The associated method blank met all quality control criteria. The method blank contained levels of 2,4-D and silvex within acceptance criteria limits.

54IDMH20 was used as the original to prepare the duplicate matrix spikes as requested. The associated duplicate matrix spikes met all advisory accuracy and precision criteria. The associated Laboratory Control Sample (LCS) met all accuracy criteria.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Elsie S. Byrd

Elsie S. Byrd
Senior Scientist I
December 24, 2002

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMH20

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2797

Matrix: (soil/water) WATER Lab Sample ID: S2797-1

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:12/17/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 12/18/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	1.2	JB
93-72-1	silvex	0.15	JBP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2797

SOW No.: SW846

EPA Sample No.	Lab Sample ID.
54IDMH20	S2797-1
54IDMH20D	WG21976-3
54IDMH20S	WG21976-1
54IDMH20SD	WG21976-2
LEACH BLK	WG22002-1

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: THE FOLLOWING ANALYTES HAVE BEEN FLAGGED WITH AN "E" TO INDICATE SERIAL DILUTION RESULTS WHICH WERE OUTSIDE CONTROL LIMITS:
BARIUM

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Mary K Powell Name: Mary K. Powell

Date: December 24, 2002 Title: Data Reviewer II

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INORGANIC CASE SUMMARY NARRATIVE
SDG # S2797
PROTOCOL #SW-846

The indicated Sample Delivery Group (SDG) consisting of one (1) one sample was received into the laboratory management system (LIMS) on December 13, 2002 intact and in good condition with Chain of Custody in order. Sample ID's reported in this data package are noted by the receiving department on the COC if they differ from those listed by the samplers on the COC.

The sample was analyzed for the TCLP list (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) using analytical methods delineated in SW-846 (Update III).

SAMPLE IDs:

The cover page contained in this package lists the client ID's and the associated CompuChem numbers which are part of this SDG.

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (ICV, CCV), blanks (ICB, CCB) and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 allowable limits.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges. All field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The sample matrix spike WG21976-1 (54IDMH2OS) was inside control limits for all requested analytes. The sample matrix spike duplicate, WG21976-2 (54IDMH2OSD) was inside control limits for all requested analytes.

SW-846 control limits for matrix spike recoveries are set at 75% to 125% of the analyte quantity added unless original sample concentrations exceed the true values of these "spikes" by a factor of four or more; in this case effected analytes are not flagged even if recoveries fall outside percentage recovery control limits.

The sample matrix duplicate, WG21976-3 (54IDMH2OD) was inside control limits for all requested analytes..

SW-846 control limits for duplicate determinations are +/- 20% Relative Percent Difference (RPD) for concentrations greater than or equal to five times the CRDL in both the original and duplicate samples, and +/- the CRDL for concentrations less than five times the CRDL. The RPD is not calculated if both the original and duplicate values fall below the IDL.

A five-fold serial dilution of sample, S2797-1 (54IDWH2OL) was performed in accordance with SW-846 requirements for ICP analysis.

The adjusted sample concentrations were outside control limits for barium which is flagged with an "E" on all associated form 1, the cover page, and form 9.

An "E" indicates that a chemical or physical interference effect was encountered during the analysis of the flagged analyte. As a result of this interference, all values for the analyte in the same matrix must be considered to be estimated quantities.

SW-846 control limits for serial dilution are defined as a deviation less than or equal to 10% in the dilution-adjusted concentrations from the original values for all analyte concentrations with values greater than fifty (50) times their respective Instrument Detection Limit (IDL) in the original sample.

Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Mary K. Powell
Data Reviewer II
December 24, 2002

Note: This report is paginated for reference and accountability.

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54IDMH20

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2797

Matrix (soil/water): WATER Lab Sample ID: S2797-1

Level (low/med): LOW Date Received: 12/13/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.0	U		P
7440-39-3	Barium	50.5	B	E	P
7440-43-9	Cadmium	2.0	B		P
7440-47-3	Chromium	498	B		P
7439-92-1	Lead	15.0	B		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	3.0	U		P
7440-22-4	Silver	0.80	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

13

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

54IDMH20

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: S2797

Matrix (soil/water): WATER Lab Sample ID: S2797-1

Date Received: 12/13/02 % Solids: 100.00

Concentration Units (mg/L or mg/kg dry weight): mg/L

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Reactive Sulfide	250	U			12/19/02
Corrosivity as pH	6.69				12/19/02
Reactive Cyanide	125	U			12/19/02

Comments: Corrosivity is reported in pH Units.

SW846 METALS

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: COMPUCHEM Contract: _____

Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: T2797

SOW No.: SW846

EPA Sample No.	Lab Sample ID.
54IDMSOIL	T2797-1
54IDMSOILD	WG22059-3
54IDMSOILS	WG22059-1
54IDMSOILSD	WG22059-2
LEACH BLK	WG22002-1

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: _____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Mary K Powell Name: Mary K. Powell

Date: December 26, 2002 Title: Data Reviewer II

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SDG NARRATIVE
SDG #T2797

SAMPLE IDENTIFICATIONS: 54IDMSOIL

The one soil sample listed above was received intact, at 4.6 degrees C, with proper documentation, in sealed shipping containers, on December 13, 2002, and was scheduled for volatile TCLP, metals TCLP, semivolatile TCLP, herbicide TCLP, pesticide TCLP, reactive cyanide, reactive sulfide, ignitability, and corrosivity analysis.
The volatile fraction sample was prepared by ZHE extraction, and analyzed following SW846 Method 8260B. All pertinent Quality Assurance Notices are included in the narrative section, and all pertinent Laboratory Notices SDG # T2797 are included in the sample data sections. Analysis holding time requirements were met this sample.

No target analytes were identified in the submitted sample above the reporting limits.

No searches were conducted for Tentatively Identified Compounds (TICs) per client request.

All Bromofluorobenzene (BFB) abundance criteria were met for tunes associated to this SDG. Overall QC criteria were met for all initial and continuing calibration standards associated to this SDG.

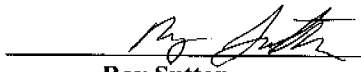
All of the system monitoring compounds(SMCs) met recovery criteria in the analysis of this sample, and all of the internal standards met response and retention time criteria in the analysis of this sample.

The associated method blank, and ZHE blank met all QC criteria, and did not contain any target analytes above the reporting limits.

The duplicate matrix spikes generated from this original met all QC precision and accuracy criteria without exception. The associated Laboratory Control Sample(LCS) met all accuracy criteria.

Manual quantitations were performed on the process files in the associated initial and continuing calibration(s). The reasons have been coded with explanations provided in the notice included in the narrative section of this SDG.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.



Roy Sutton
Case Reviewer
December 24, 2002

CompuChem
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Notification Regarding Manual Editing/Integration Flags

In some instances, manual adjustments to the software output are necessary to provide accurate data. These manual integrations are performed by the data reviewers, GC/MS operators, or GC chemists. An Extracted Ion Current Profile (EICP) or a GC chromatographic peak has been provided for the manual integration performed on each compound to demonstrate the accuracy of that process. The manual integrations are flagged on the quantitation report in the far right column beyond the FINAL concentration for GC/MS analysis, and in the "Flags" column for GC analysis. The manual editing/integration flags are:

M - Denotes that a manual integration has been performed for this compound. The manual integration was performed in order to provide the most accurate area count possible for the peak.

H - Denotes that a data reviewer, GC/MS operator, or GC Chemist has chosen an alternate peak within the retention time window from that chosen by the software for that compound. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

MH - Denotes that an alternate peak has been chosen within the retention time window from that chosen by the software for that compound and also a manual integration of the chosen peak has been performed. The manual integration was performed in order to provide the most accurate area count possible for the peak.

L - Denotes that a data reviewer or GC/MS operator has selected an alternate library search. This is typically done when an additional tentatively identified compound (TIC) has been added to the number of peaks searched. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

ML - Denotes that an alternate library search has been selected and a manual integration has also been performed. This is typically done when an additional TIC has been added and the TIC peak also required a manual integration.

The EPA CLP SOW documents require additional explanations for manual editing/integration. In the accompanying raw data packages, additional codes have been applied to the "M" flag and carry the following meanings;

M1 - The compound was initially not found by the automatic integration routine.

M2 - The compound was incorrectly integrated by the automatic integration routine.

M3 - The co-eluting compounds were incorrectly integrated by the automatic integration routine.

These codes will appear in the GC/MS and GC data packages.

Robert E. Meierer
Vice President

DATA REPORTING QUALIFIERS (continued)

C : This flag applies to GC or HPLC results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, this flag is not applied; a laboratory-defined flag is used instead (see the X/Y/Z qualifier.)

B : This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. This flag is used for a TIC as well as for a positively identified target compound. The combination of flags BU or UB is not an allowable policy. Blank contaminants are flagged with a B only when they are detected in the sample.

E : This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis. If one or more compounds have a response greater than the upper level of the calibration range, the sample or extract will be diluted and reanalyzed. All such compounds with a response greater than the upper level of the calibration range will have the concentration flagged with an E on the Form I for the original analysis.

D : If a sample or extract is reanalyzed at a higher dilution factor, for example when the concentration of an analyte exceeds the upper calibration range, the DL suffix is appended to the sample number on the Form I for the more diluted sample, and **all** reported concentrations on that Form I are flagged with the D flag. This flag alerts data users that any discrepancies between the reported concentrations may be due to dilution of the sample or extract.

NOTE 1: The D flag is not applied to compounds that are not detected in the sample analysis i.e., compounds reported with the CRQL (or Reporting Limit) and the U flag.

NOTE 2: Separate Forms I are used for reporting the original analysis (Client Sample No. XXXXX) and the more diluted sample analysis (Client Sample No. XXXXXDL) i.e., the results from both analyses are not combined on a single Form I.

A : This flag indicates that a TIC is a suspected aldol-condensation product.

X/Y/Z : Other specific flags may be required to properly define the results. If used, the flags will be fully described in the SDG Narrative. The laboratory-defined flags are limited to X, Y and Z.

DATA REPORTING QUALIFIERS

On the Form I, under the column labeled "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. Up to five qualifiers may be reported on Form I for each compound. The qualifiers used are:

U : This flag indicates the compound was analyzed for but not detected. The Contract Required Quantitation Limit (CRQL), or reporting limit, will be adjusted to reflect any dilution and, for soils, the percent moisture.

J : This flag indicates an estimated value. The flag is used as detailed below:

1. When estimating a concentration for tentatively identified compounds (TICs) where a response factor of 1.0 is assumed for the TIC analyte,

2. When the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL (or Reporting Limit) but greater than zero, and

3. When the retention time data indicate the presence of a compound that meets the pesticide/Aroclor or other GC or HPLC identification criteria, and the result is less than the CRQL (or Reporting Limit) but greater than zero. For example, if the CRQL (or Reporting Limit) is 10 µg/L, but a concentration of 3 µg/L is calculated, it is reported as 3J.

N : This flag indicates presumptive evidence of a compound. This flag is only used for TICs, where the identification is based on a mass spectral library search. For generic characterization of a TIC such as 'chlorinated hydrocarbon', the N flag is not used.

P : In the EPA's Contract Laboratory Program (CLP), this flag is used for a pesticide/Aroclor target analyte, when there is greater than a 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a P.
For SW-846 GC and HPLC analyses, when the Relative Percent Difference (RPD) is greater than 40% and there is no evidence of chromatographic anomalies or interferences, then the higher of the two values is reported and flagged with a P. When the RPD is equal to or less than 40%, our policy is to also report the higher of the two values, although the choice could be a project specific issue.

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMSOIL

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2797

Matrix: (soil/water) WATER Lab Sample ID: T2797-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: T2797-1A59

Level: (low/med) LOW Date Received: 12/13/02

% Moisture: not dec. _____ Date Analyzed: 12/23/02

GC Column: ZB-624 ID: 0.32 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	25	U
75-35-4	1,1-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
127-18-4	Tetrachloroethene	25	U
108-90-7	Chlorobenzene	25	U

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SDG NARRATIVE

SDG # T2797
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS: 54IDMSOIL.

The one leachate sample listed above was received intact, properly refrigerated at 4.6°C, with proper documentation, in sealed shipping containers, on December 13, 2002. The samples were scheduled for the requested analyses of the semivolatile fraction. This portion of the SDG narrative deals with the semivolatile fractions only. SW-846, 3rd Edition, Update 3, the Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311), Separatory Funnel extraction (Method 3510C), and Method 8270C were used to prepare and analyze this sample, with the exceptions and/or additions requested by the client. All pertinent Quality Assurance Notices are included in the narrative section, and all pertinent Laboratory Notices for SDG # T2797 are included in the sample data sections. Extraction and analysis holding time requirements were met for this sample.

There were no semivolatile project analytes identified above the Quantitation Limit (QL) in this sample. Manual quantitations were performed on one or more of the process files associated with this SDG. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

All decafluorotriphenylphosphine (DFTPP) abundance criteria were met for tunes associated to this SDG. Tailing factor criteria were met for pentachlorophenol and benzidine. The breakdown criterion was met for DDT. These three compounds have been added to the DFTPP solution and analyzed together. Overall QC criteria were met for all initial and continuing calibration standards associated to this SDG. All of the surrogates met recovery criteria in the analysis of this sample. All of the internal standards met response and retention time criteria in the analysis of this sample. The associated method blank met all quality control criteria. 54IDMSOIL was used as the original to prepare the duplicate matrix spikes. The associated duplicate matrix spikes met all advisory accuracy and precision criteria. The associated Laboratory Control Sample (LCS) met all accuracy criteria.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Rebecca K Mead

Rebecca K. Mead
Supervisor, GC/MS SVOA
December 26, 2002

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMSOIL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2797

Matrix: (soil/water) WATER Lab Sample ID: T2797-1

Sample wt/vol: 100 (g/mL) ML Lab File ID: T2797-1B60

Level: (low/med) LOW Date Received: 12/13/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/17/02

Concentrated Extract Volume: 500(uL) Date Analyzed: 12/20/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	50	U

CompuChem

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SDG NARRATIVE

SDG T2797

SAMPLE IDENTIFICATION: 54IDMSOIL

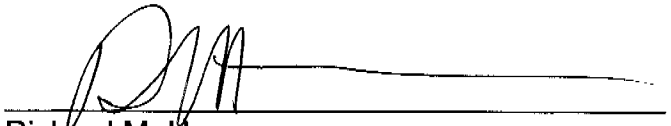
The one solid sample listed above was scheduled for the requested analysis of the pesticide TCLP fraction. This portion of the SDG narrative deals with the pesticide fraction only. SW-846, 3rd Edition, Update 3, Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311), Separatory Funnel Extraction (Method 3510C) and Method 8081A were used to prepare and analyze this sample, with the exceptions and/or additions requested by the client. All pertinent Quality Assurance Notices are included in the narrative section and all pertinent Laboratory Notices for SDG T2797 are included in the sample data sections.

Pesticide Section:

Extraction and analysis holding time requirements were met for this sample. There were no Target Compound List (TCL) analytes identified above the Contract Required Quantitation Limit (CRQL) in this sample. Manual quantitations were performed on one or more of the process files associated with this SDG. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

Overall QC criteria were met for all initial and continuing calibration standards associated to this SDG. All samples met QC recovery criteria for surrogates. The associated method blanks met all quality control criteria.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.



Richard M. Henson
Technical Director
December 26, 2002

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMSOIL

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2797

Matrix: (soil/water) WATER Lab Sample ID: T2797-1

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:12/17/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/18/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

CompuChem

a division of Liberty Analytical Corporation
501 Madison Avenue
Cary, N.C. 27513
Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE

SDG T2797

SAMPLE IDENTIFICATION: 54IDMSOIL

The one solid sample listed above was scheduled for the requested analysis of the pesticide TCLP fraction. This portion of the SDG narrative deals with the pesticide fraction only. SW-846, 3rd Edition, Update 3, Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311), Separatory Funnel Extraction (Method 3510C) and Method 8081A were used to prepare and analyze this sample, with the exceptions and/or additions requested by the client. All pertinent Quality Assurance Notices are included in the narrative section and all pertinent Laboratory Notices for SDG T2797 are included in the sample data sections.

Pesticide Section:

Extraction and analysis holding time requirements were met for this sample. There were no Target Compound List (TCL) analytes identified above the Contract Required Quantitation Limit (CRQL) in this sample. Manual quantitations were performed on one or more of the process files associated with this SDG. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

Overall QC criteria were met for all initial and continuing calibration standards associated to this SDG. All samples met QC recovery criteria for surrogates. The associated method blanks met all quality control criteria.

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Richard M. Henson
Technical Director
December 26, 2002

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMSOIL

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2797

Matrix: (soil/water) WATER Lab Sample ID: T2797-1

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/13/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:12/17/02

Concentrated Extract Volume: 2500(ul) Date Analyzed: 12/18/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	2.7	JP
93-72-1	silvex	0.40	JBP

CompuChem
A Division of Liberty Analytical Corp.
501 Madison Avenue Cary, NC 27513

INORGANIC CASE SUMMARY NARRATIVE
SDG # T2797
PROTOCOL #SW-846

The indicated Sample Delivery Group (SDG) consisting of one (1) one sample was received into the laboratory management system (LIMS) on December 13, 2002 intact and in good condition with Chain of Custody in order. Sample ID's reported in this data package are noted by the receiving department on the COC if they differ from those listed by the samplers on the COC.

The sample was analyzed for the TCLP list (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) using analytical methods delineated in SW-846 (Update III).

SAMPLE IDs:

The cover page contained in this package lists the client ID's and the associated CompuChem numbers which are part of this SDG.

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (ICV, CCV), blanks (ICB, CCB) and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 allowable limits.

SAMPLE PREPARATION QUALITY CONTROL:

The sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges. All field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The sample matrix spike WG22059-1 (54IDMSOILS) was inside control limits for all requested analytes. The sample matrix spike duplicate, WG22059-2 (54IDMSOILSD) was inside control limits for all requested analytes.

SW-846 control limits for matrix spike recoveries are set at 75% to 125% of the analyte quantity added unless original sample concentrations exceed the true values of these "spikes" by a factor of four or more; in this case effected analytes are not flagged even if recoveries fall outside percentage recovery control limits.

The sample matrix duplicate, WG22059-3 (54IDMSOILD) was inside control limits for all requested analytes..

SW-846 control limits for duplicate determinations are +/- 20% Relative Percent Difference (RPD) for concentrations greater than or equal to five times the CRDL in both the original and duplicate samples, and +/- the CRDL for concentrations less than five times the CRDL. The RPD is not calculated if both the original and duplicate values fall below the IDL.

A five-fold serial dilution of sample, T2797-1 (54IDMSOILL) was performed in accordance with SW-846 requirements for ICP analysis.

The adjusted sample concentrations were inside control limits for all requested analytes.

SW-846 control limits for serial dilution are defined as a deviation less than or equal to 10% in the dilution-adjusted concentrations from the original values for all analyte concentrations with values greater than fifty (50) times their respective Instrument Detection Limit (IDL) in the original sample.

Release of the data contained in this hard copy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Mary K. Powell
Data Reviewer II
December 26, 2002

Note: This report is paginated for reference and accountability.

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54IDMSOIL

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2797

Matrix (soil/water): WATER Lab Sample ID: T2797-1

Level (low/med): LOW Date Received: 12/13/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.5	U		P
7440-39-3	Barium	799	B		P
7440-43-9	Cadmium	1.7	B		P
7440-47-3	Chromium	171	B		P
7439-92-1	Lead	16.1	B		P
7439-97-6	Mercury	0.18	B		CV
7782-49-2	Selenium	8.6	B		P
7440-22-4	Silver	0.70	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

54IDMSOIL

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: T2797

Matrix (soil/water): SOIL Lab Sample ID: T2797-1

Date Received: 12/13/02 % Solids: 83.65

Concentration Units (mg/L or mg/kg dry weight): mg/Kg

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Reactive Cyanide	149	U			12/19/02
Corrosivity as pH	7.00				12/19/02
Paint Filter	NO				12/17/02
Ignitability	>140				12/17/02
Reactive Sulfide	299	U			12/19/02

Comments: Corrosivity is reported in pH Units, Ignitability in Degrees F, Paint Filter Yes/No as to content of free liquid.

2

SW-846

COVER PAGE - GENERAL CHEMISTRY ANALYSES DATA PACKAGE

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

COW No.: SDG No.: Q2901

EPA Sample No.	Lab Sample ID.
54IDMSOIL2	Q2901-1
54IDMSOIL3	Q2901-2

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: Paul Cvetich

Date: 3-12-03 Title: Data Reviewer

CompuChem

a division of Liberty Analytical Corporation
501 Madison Avenue
Cary, N.C. 27513
Tel: 919/379-4100 Fax: 919/379-4050

SDG NARRATIVE
SDG # Q2901
PROTOCOL: SW-846

SAMPLE IDENTIFICATIONS:
54IDMSOIL2
54IDMSOIL3

The two soil samples listed above were received intact, properly refrigerated, with proper documentation, in sealed shipping containers, on March 6, 2003. The samples were scheduled for the requested analyses of the pesticide TCLP fractions. SW-846, 3rd Edition, Update 3, the Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311), and Method 8081A were used to prepare and analyze these samples, with the exceptions and/or additions requested by the client. This portion of the SDG narrative deals with the pesticide TCLP fraction only. All pertinent Quality Assurance notices are included in the narrative section and all pertinent Laboratory notices for SDG # Q2901 are included in the sample data sections.

Pesticides TCLP

Extraction and analysis holding time requirements were met for all of these samples. There were no pesticide TCLP analytes confirmed by dual column above the Quantitation Limit (QL) in these samples. Manual quantitations were performed on one or more of the process files associated with this SDG, including sample 54IDMSOIL3. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG.

All QC criteria were met for all initial and continuing calibration standards associated to this SDG.

All of the surrogates met recovery and retention time criteria in the analyses of these samples.

The associated method blank met all quality control criteria.

Sample 54IDMSOIL3 was used as the original to prepare the duplicate matrix spikes. The associated duplicate matrix spikes met all accuracy and precision criteria. The associated Laboratory Control Sample (LCS) prepared and analyzed along with these samples met all accuracy criteria.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Elsie S. Byrd
Senior Scientist I
March 19, 2003

Notification Regarding Manual Editing/Integration Flags

In some instances, manual adjustments to the software output are necessary to provide accurate data. These manual integrations are performed by the data reviewers, GC/MS operators, or GC chemists. An Extracted Ion Current Profile (EICP) or a GC chromatographic peak has been provided for the manual integration performed on each compound to demonstrate the accuracy of that process. The manual integrations are flagged on the quantitation report in the far right column beyond the FINAL concentration for GC/MS analysis, and in the "Flags" column for GC analysis. The manual editing/integration flags are:

M - Denotes that a manual integration has been performed for this compound. The manual integration was performed in order to provide the most accurate area count possible for the peak.

H - Denotes that the data reviewer, GC/MS operator, or GC Chemist has chosen an alternate peak within the retention time window from that chosen by the software for that compound. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

MH - Denotes that an alternate peak has been chosen within the retention time window from that chosen by the software for that compound and also a manual integration of the chosen peak has been performed. The manual integration was performed in order to provide the most accurate area count possible for the peak.

L - Denotes that a data reviewer or GC/MS operator has selected an alternate library search. This is typically done when an additional tentatively identified compound (TIC) has been added to the number of peaks searched. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

ML - Denotes that an alternate library search has been selected and a manual integration has also been performed. This is typically done when an additional TIC has been added and the TIC peak also required a manual integration.

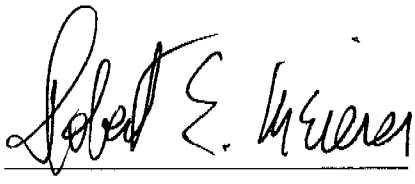
The EPA CLP SOW documents require additional explanations for manual editing/integration. In the accompanying raw data packages, additional codes have been applied to the "M" flag and carry the following meanings;

M1 - The compound was not found by the automatic integration routine.

M2 - The compound was incorrectly integrated by the automatic integration routine.

M3 - The co-eluting compounds were incorrectly integrated by the automatic integration routine.

These codes will appear in the GC/MS and GC data packages.



Robert E. Meierer
Vice President

DATA REPORTING QUALIFIERS

On the Form I, under the column labeled "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. Up to five qualifiers may be reported on Form I for each compound. The qualifiers used are:

U : This flag indicates the compound was analyzed for but not detected. The Contract Required Quantitation Limit (CRQL), or reporting limit, will be adjusted to reflect any dilution and, for soils, the percent moisture.

J : This flag indicates an estimated value. The flag is used as detailed below:

1. When estimating a concentration for tentatively identified compounds (TICs) where a response factor of 1.0 is assumed for the TIC analyte,

2. When the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the CRQL (or Reporting Limit) but greater than zero, and

3. When the retention time data indicate the presence of a compound that meets the pesticide/Aroclor or other GC or HPLC identification criteria, and the result is less than the CRQL (or Reporting Limit) but greater than zero. For example, if the CRQL (or Reporting Limit) is 10 µg/L, but a concentration of 3 µg/L is calculated, it is reported as 3J.

N : This flag indicates presumptive evidence of a compound. This flag is only used for TICs, where the identification is based on a mass spectral library search. For generic characterization of a TIC such as 'chlorinated hydrocarbon', the N flag is not used.

P : In the EPA's Contract Laboratory Program (CLP), this flag is used for a pesticide/Aroclor target analyte, when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a P.
For SW-846 GC and HPLC analyses, when the Relative Percent Difference (RPD) is greater than 40% and there is no evidence of chromatographic anomalies or interferences, then the higher of the two values is reported and flagged with a P. When the RPD is equal to or less than 40%, our policy is to also report the higher of the two values, although the choice could be a project specific issue. For certain HPLC analyses, if one of the HPLC columns displays co-elution of target analytes, all results are reported from a primary column displaying no co-elution. Results are still flagged with a P if the RPD between columns is greater than 40%.

DATA REPORTING QUALIFIERS (continued)

C : This flag applies to GC or HPLC results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, this flag is not applied; a laboratory-defined flag is used instead (see the X/Y/Z qualifier.)

B : This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. This flag is used for a TIC as well as for a positively identified target compound. The combination of flags BU or UB is not an allowable policy. Blank contaminants are flagged B only when they are detected in the sample.

E : This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis. If one or more compounds have a response greater than the upper level of the calibration range, the sample or extract will be diluted and reanalyzed. All such compounds with a response greater than the upper level of the calibration range will have the concentration flagged with an E on Form I for the original analysis.

D : If a sample or extract is reanalyzed at a higher dilution factor, for example when the concentration of an analyte exceeds the upper calibration range, the DL suffix is appended to the sample number on Form I for the more diluted sample, and **all** reported concentrations on that Form I are flagged with the D flag. This flag alerts data users that any discrepancies between the reported concentrations may be due to dilution of the sample or extract.

NOTE 1: The D flag is not applied to compounds which are not detected in the sample analysis i.e. compounds reported with the CRQL (or Reporting Limit) and the U flag.

NOTE 2: Separate Form Is are used for reporting the original analysis (Client Sample No. XXXXX) and the more diluted sample analysis (Client Sample No. XXXXXDL) i.e. the results from both analyses <u>are not combined</u> on a single Form I.

A : This flag indicates that a TIC is a suspected aldol-condensation product.

X/Y/Z : Other specific flags may be required to properly define the results. If used, the flags will be fully described in the SDG Narrative. The laboratory-defined flags are limited to X, Y and Z.

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMSOIL2

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2901

Matrix: (soil/water) WATER Lab Sample ID: Q2901-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: Q2901-1RA61

Level: (low/med) LOW Date Received: 03/06/03

% Moisture: not dec. _____ Date Analyzed: 03/18/03

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 5.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	25	U
75-35-4	1,1-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
127-18-4	Tetrachloroethene	25	U
108-90-7	Chlorobenzene	25	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMSOIL3

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2901

Matrix: (soil/water) WATER Lab Sample ID: Q2901-2

Sample wt/vol: 5 (g/ml) ML Lab File ID: Q2901-2RA61

Level: (low/med) LOW Date Received: 03/06/03

% Moisture: not dec. _____ Date Analyzed: 03/18/03

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	25	U
75-35-4	1,1-Dichloroethene	25	U
78-93-3	2-butanone	63	U
67-66-3	Chloroform	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	25	U
127-18-4	Tetrachloroethene	25	U
108-90-7	Chlorobenzene	25	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMSOIL2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2901

Matrix: (soil/water) WATER Lab Sample ID: Q2901-1

Sample wt/vol: 100 (g/mL) ML Lab File ID: Q2901-1A64

Level: (low/med) LOW Date Received: 03/06/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/12/03

Concentrated Extract Volume: 500(uL) Date Analyzed: 03/12/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	100	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMSOIL3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2901

Matrix: (soil/water) WATER Lab Sample ID: Q2901-2

Sample wt/vol: 100 (g/mL) ML Lab File ID: Q2901-2A64

Level: (low/med) LOW Date Received: 03/06/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/12/03

Concentrated Extract Volume: 500(uL) Date Analyzed: 03/12/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	100	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMSOIL2

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2901

Matrix: (soil/water) WATER Lab Sample ID: Q2901-1

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/06/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/12/03

Concentrated Extract Volume: 5000(uL) Date Analyzed: 03/13/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMSOIL3

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2901

Matrix: (soil/water) WATER Lab Sample ID: Q2901-2

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/06/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/12/03

Concentrated Extract Volume: 5000(uL) Date Analyzed: 03/13/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.11	J
1024-57-3	Heptachlor Epoxide	0.15	J
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	1.7	J

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMSOIL2

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2901

Matrix: (soil/water) WATER Lab Sample ID: Q2901-1

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/06/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/11/03

Concentrated Extract Volume: 2500(ul) Date Analyzed: 03/13/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	12	U
93-72-1	silvex	12	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMSOIL3

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2901

Matrix: (soil/water) WATER Lab Sample ID: Q2901-2

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/06/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/11/03

Concentrated Extract Volume: 2500(ul) Date Analyzed: 03/13/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	12	U
93-72-1	silvex	12	U

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54IDMSOIL2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2901

Matrix (soil/water): WATER Lab Sample ID: Q2901-1

Level (low/med): LOW Date Received: 3/6/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.7	U		P
7440-39-3	Barium	759	B		P
7440-43-9	Cadmium	0.64	B		P
7440-47-3	Chromium	1.6	B		P
7439-92-1	Lead	4.6	B		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	4.9	B		P
7440-22-4	Silver	0.70	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

03

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54IDMSOIL3

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2901

Matrix (soil/water): WATER Lab Sample ID: Q2901-2

Level (low/med): LOW Date Received: 3/6/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.7	U		P
7440-39-3	Barium	1630	B		P
7440-43-9	Cadmium	4.4	B		P
7440-47-3	Chromium	5.0	B		P
7439-92-1	Lead	88.4	B		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	4.8	B		P
7440-22-4	Silver	0.70	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

09

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

54IDMSOIL2

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: Q2901

Matrix (soil/water): SOIL Lab Sample ID: Q2901-1

Date Received: 3/6/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): pH units

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Corrosivity as pH	6.85				3/10/03
Paint Filter	NO				3/12/03

Comments: **Paint Filter is reported as YES/NO as to the content of free liquid in each sample.**

2

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

54IDMSOIL3

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: Q2901

Matrix (soil/water): SOIL Lab Sample ID: Q2901-2

Date Received: 3/6/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): pH units

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Corrosivity as pH	8.09				3/10/03
Paint Filter	NO				3/12/03

Comments: **Paint Filter is reported as YES/NO as to the content of free liquid in each sample.**

3

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMH203

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-1

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2901-1A61

Level: (low/med) LOW Date Received: 03/07/03

% Moisture: not dec. _____ Date Analyzed: 03/13/03

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	5	U
75-35-4	1,1-Dichloroethene	5	U
78-93-3	2-butanone	2	J
67-66-3	Chloroform	5	J
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
127-18-4	Tetrachloroethene	5	U
108-90-7	Chlorobenzene	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMH2O4

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-2

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2901-2A61

Level: (low/med) LOW Date Received: 03/07/03

% Moisture: not dec. _____ Date Analyzed: 03/13/03

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	5	U
75-35-4	1,1-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	3	J
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
127-18-4	Tetrachloroethene	5	U
108-90-7	Chlorobenzene	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMH2O5

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-3

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2901-3A61

Level: (low/med) LOW Date Received: 03/07/03

% Moisture: not dec. _____ Date Analyzed: 03/13/03

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	5	U
75-35-4	1,1-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
127-18-4	Tetrachloroethene	5	U
108-90-7	Chlorobenzene	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK03

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-4

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2901-4A61

Level: (low/med) LOW Date Received: 03/07/03

% Moisture: not dec. _____ Date Analyzed: 03/13/03

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	5	U
75-35-4	1,1-Dichloroethene	5	U
78-93-3	2-butanone	2	J
67-66-3	Chloroform	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	0.2	J
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
127-18-4	Tetrachloroethene	5	U
108-90-7	Chlorobenzene	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK04

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-5

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2901-5A61

Level: (low/med) LOW Date Received: 03/07/03

% Moisture: not dec. _____ Date Analyzed: 03/13/03

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	5	U
75-35-4	1,1-Dichloroethene	5	U
78-93-3	2-butanone	13	U
67-66-3	Chloroform	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
127-18-4	Tetrachloroethene	5	U
108-90-7	Chlorobenzene	5	U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIPBLANK05

Lab Name: COMPUCHEM Method: 8260B

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-6

Sample wt/vol: 5 (g/ml) ML Lab File ID: R2901-6A61

Level: (low/med) LOW Date Received: 03/07/03

% Moisture: not dec. _____ Date Analyzed: 03/13/03

GC Column: RTX-VMS ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	5	U
75-35-4	1,1-Dichloroethene	5	U
78-93-3	2-butanone	2	J
67-66-3	Chloroform	5	U
56-23-5	Carbon Tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
127-18-4	Tetrachloroethene	5	U
108-90-7	Chlorobenzene	5	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMH2O4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-2

Sample wt/vol: 100 (g/mL) ML Lab File ID: R2901-2A64

Level: (low/med) LOW Date Received: 03/07/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/12/03

Concentrated Extract Volume: 500(uL) Date Analyzed: 03/13/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	100	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54IDMH2O5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-3

Sample wt/vol: 100 (g/mL) ML Lab File ID: R2901-3A64

Level: (low/med) LOW Date Received: 03/07/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/12/03

Concentrated Extract Volume: 500(uL) Date Analyzed: 03/13/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	50	U
106-46-7	1,4-Dichlorobenzene	50	U
95-48-7	2-Methylphenol	50	U
108-39-4	3-Methylphenol	50	U
106-44-5	4-Methylphenol	50	U
67-72-1	Hexachloroethane	50	U
98-95-3	Nitrobenzene	50	U
87-68-3	Hexachlorobutadiene	50	U
88-06-2	2,4,6-Trichlorophenol	50	U
95-95-4	2,4,5-Trichlorophenol	50	U
121-14-2	2,4-Dinitrotoluene	50	U
118-74-1	Hexachlorobenzene	50	U
87-86-5	Pentachlorophenol	100	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMH2O3

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-1

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/07/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/12/03

Concentrated Extract Volume: 5000(uL) Date Analyzed: 03/13/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMH2O4

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-2

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/07/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/12/03

Concentrated Extract Volume: 5000(uL) Date Analyzed: 03/14/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMH205

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-3

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/07/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/12/03

Concentrated Extract Volume: 5000(uL) Date Analyzed: 03/14/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
58-89-9	gamma-BHC (Lindane)	0.50	U
72-20-8	Endrin	2.0	U
76-44-8	Heptachlor	0.50	U
1024-57-3	Heptachlor Epoxide	0.50	U
72-43-5	Methoxychlor	5.0	U
8001-35-2	Toxaphene	50	U
12789-03-6	Technical Chlordane	16	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMH203

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-1

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/07/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/11/03

Concentrated Extract Volume: 2500(ul) Date Analyzed: 03/13/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	12	U
93-72-1	silvex	12	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMH2O4

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-2

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/07/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/11/03

Concentrated Extract Volume: 2500(ul) Date Analyzed: 03/13/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	12	U
93-72-1	silvex	12	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54IDMH205

Lab Name: COMPUCHEM Contract: 8151A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix: (soil/water) WATER Lab Sample ID: R2901-3

Sample wt/vol: 100.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/07/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/11/03

Concentrated Extract Volume: 2500(ul) Date Analyzed: 03/13/03

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
94-75-7	2,4-D	12	U
93-72-1	silvex	12	U

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54IDMH203

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix (soil/water): WATER Lab Sample ID: R2901-1

Level (low/med): LOW Date Received: 03/07/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.7	U		P
7440-39-3	Barium	70.1	B		P
7440-43-9	Cadmium	3.4	B		P
7440-47-3	Chromium	1.9	B		P
7439-92-1	Lead	4.2	B		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	3.2	B		P
7440-22-4	Silver	0.70	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54IDMH204

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix (soil/water): WATER Lab Sample ID: R2901-2

Level (low/med): LOW Date Received: 03/07/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.7	U		P
7440-39-3	Barium	89.6	B		P
7440-43-9	Cadmium	0.40	U		P
7440-47-3	Chromium	1.0	B		P
7439-92-1	Lead	1.1	U		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	2.6	U		P
7440-22-4	Silver	0.70	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54IDMH205

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2901

Matrix (soil/water): WATER Lab Sample ID: R2901-3

Level (low/med): LOW Date Received: 03/07/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.7	U		P
7440-39-3	Barium	99.2	B		P
7440-43-9	Cadmium	0.40	U		P
7440-47-3	Chromium	1.8	B		P
7439-92-1	Lead	2.3	B		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	2.6	U		P
7440-22-4	Silver	0.70	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

54IDMH203

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: R2901

Matrix (soil/water): WATER Lab Sample ID: R2901-1

Date Received: 3/7/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): Degree F

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Ignitability	>140				3/11/03
Corrosivity as pH	7.86				3/10/03

Comments: Ignitability is reported in Degrees F, Corrosivity is reported in pH units.

2

SW-846

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

54IDMH204

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: R2901

Matrix (soil/water): WATER Lab Sample ID: R2901-2

Date Received: 3/7/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): pH units

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Corrosivity as pH	7.54				3/10/03
Ignitability	>140				3/11/03

Comments: Ignitability is reported in Degrees F, Corrosivity is reported in pH units.

1-CC

CLASSICAL CHEMISTRY ANALYSES DATA SHEET

EPA SAMPLE NO.

54IDMH205

Lab Name: CompuChem Contract:

Lab Code: LIBRTY Case No.: NRAS No.:

SDG No.: R2901

Matrix (soil/water): WATER Lab Sample ID: R2901-3

Date Received: 3/7/03 % Solids: 0.00

Concentration Units (mg/L or mg/kg dry weight): pH units

PARAMETER	CONCENTRATION	C	Q	M	DATE ANALYZED
Corrosivity as pH	7.35				3/10/03
Ignitability	>140				3/11/03

Comments: **Ignitability is reported in Degrees F, Corrosivity is reported in pH units.**

TRIMATRIX LABORATORIES, INC.
DATA PACKAGE

PREPARED FOR:

URS Group, Inc.
5540 Falmouth Street, Suite 201
Richmond, VA 23229

FOR THE SITE:

Radford Army Ammunition Plant
SWMU 54

SDG-36440-26

February 3, 2005

Submitted by:

TriMatrix Laboratories, Inc.

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URS Group, Inc.
Radford Army Ammunition Plant
SWMU 54

SDG – 36440-26
FEBRUARY 3, 2004

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SDG CASE NARRATIVE

Radford Army Ammunition Plant
SWMU 54

SDG – 36440-26
FEBRUARY 3, 2005

This case narrative is applicable to the IDM sample collected from Radford Army Ammunition Plant (the Site), Radford, Virginia by URS Group, Inc. (the Client) and received by TriMatrix Laboratories, Inc. (TriMatrix) on January 10, 2005. The sample was assigned to TriMatrix project submittal 36440-26 for analytical services (the Project) to be performed according to:

a) Subcontract No. TMX-09112003 between the Client and TriMatrix

b) Radford Army Ammunition Plant Final Master Work Plan, August, 2003 and SWMU 54 Additional Characterization Work Instructions, July 2004, and

c) verbal and written correspondence between the Client and TriMatrix as the Project progressed.

No part of this Project was subcontracted.

Field Sample and Assigned Laboratory Sample ID Summary

For the samples received, a field sample to assigned laboratory sample ID cross-reference table follows.

Field Sample ID	Date Sampled	Laboratory Sample ID
54IDM1	01/07/05	381082

Sample Receipt and Log-in

On January 10, 2005 at 08:35 hrs, one sample cooler containing multiple containers of one IDM sample for the analysis of project-specified parameters was received at TriMatrix via FedEx (the carrier). The cooler had been shipped from the Site on January 7, 2005 for delivery the next business day.

The external custody seal affixed to the cooler was intact. The sample was received in good condition but no ice or melt water was present. The receipt temperature of the interior of the cooler was measured via a 'temperature blank' shipped with the cooler; the measured temperature, in °C, was 14.9. Shipping documents included one field chain-of-custody form and associated carrier air bill.

Sample receipt activities and observations were recorded on a TriMatrix Sample Receiving and Log-in Checklist. Copies of all referenced receipt and custody documents are provided in Section A of this data package. Correspondence regarding completed sample log-in activities will be found in Attachment 1 of this narrative.

The Client was informed regarding the receipt temperature and advised TriMatrix to proceed with analysis.

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Provision of Sample Receipt Information to Client

A copy of the COC and receipt checklist was transmitted to the Client on the same day as sample receipt. The Client did not request any modification(s) to the analyses, as requested on the COC.

Post-Receipt Sample Custody

Custody of the sample during sample preparation (if applicable) and analysis was assigned to individual analysts. Copies of completed 'internal chain of custody' forms applicable to the sample in this report are on file.

Analytical Methods

Sample preparation and analytical methods that were employed are per the Work Plan Addendum and/or subsequent discussion with the Client.

Target Analyte List and Reporting Limits

The target analyte list (by parameter) and reporting limit (goals) employed for the sample are summarized in the Work Plan Addendum and/or as agreed upon with the Client. Each reporting limit employed is at least three times the MDL per the USACE Shell for Analytical Chemistry Requirements (EM200-1-3 Feb 1, 2001) and project Data Quality Objectives (DQO).

Quality Control Limits

Per discussion with the Client, Work Plan-specified quality control limits were employed except for one parameter for which no Work Plan limits were available. For pH, internal accuracy and/or precision limits were employed.

Hold Times

The sample was leached (where applicable), extracted, and analyzed within EPA-specified hold times.

Technical Issues and Client Corrective Action Logs

General Analytical

The Client requested that, as the Project progressed, TriMatrix provide regular and timely updates regarding analytical status and any technical issues; see Attachment 1 of this narrative for e-mail correspondence. No Corrective Action Logs applicable to the samples in this submittal were generated.

Also see the individual parameter sections later in this narrative for any further discussion of parameter-specific issues.

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Sample Result Reporting Convention

Sample Results

Sample results are reported as RL "U" (e.g., 0.001 U) if the target analyte was not detected above the MDL. For multiple-compound organic analysis where the analyte has been detected, the analyte, the result, and any needed qualifier are highlighted on the report page for ease of review.

Concentration Qualifiers

If applicable, sample results are qualified with:

- a "J" flag if the analyte was detected but the concentration is greater than the MDL but less than the RL,
- a "B" flag if the analyte was also detected in the method blank (exception: if the analyte concentration in the sample is greater than or equal to ten times that found in the associated method blank, the "B" flag is not applied),
- an asterisk (*) if a LIMS-generated statement of qualification applies. Note: no qualifying statements were generated for this submittal.

In addition, the Client requested that any sample result from volatile or semivolatile GC/MS analysis impacted by a non-compliant internal standard (IS) response be flagged as "J" if the sample IS response is less than 50% but greater than or equal to 30% and "R" if the response is less than 30%. Note: no results from this submittal required this qualification.

QC Batch and Analytical Batch Designations

A QC Batch associates all samples that have been prepared together (or analyzed together if there is no preparation); it is limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.). The QC batch number is a five-digit number. Currently on some LIMS reports, it may be followed by a 3-digit number, preceded by a hyphen, representing the work shift (1, 2, or 3) and a two-digit date (mm). For most analyses, the 3-digit suffix can be ignored; an exception is Volatiles in which a Method Blank and Laboratory Fortified Blank are generated with each analytical batch.

An Analytical Batch associates all samples analyzed as a set under one analytical sequence. The analytical batch number is a six-digit number.

QC Type Designation

A glossary of the most common terms applicable to this deliverables package follows on the next several pages.

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QUALITY CONTROL SAMPLE TYPES

BLANKS

Type	Abbr.	Description	Frequency
Method Preparation Blank	MPB	The MPB is employed in any analytical process that includes sample pretreatment in order to monitor for any contaminants that may affect the sample result(s).	One per QC batch, not to exceed twenty (20) field investigative samples
Instrument Blank	BLK	The BLK is used to detect any contamination originating within the instrument system. For analyses in which there is no sample pretreatment, it is substituted for the MPB.	Depending upon the test, analysis is once per day, 12 hours, and/or at the beginning of an analytical run. If it is analyzed in lieu of an MPB, the frequency is one per QC Batch, not to exceed twenty (20) field investigative samples.
Initial Calibration Blank	ICB	The ICB is a reagent blank analyzed as a sample after the calibration curve has been generated. It is used to evaluate instrument calibration in a region of the curve below the reporting limit and near the limit of detection.	One per analytical batch immediately following the initial calibration or as specified in the analytical method.
Continuing Calibration Blank	CCB	The CCB is a reagent blank analyzed periodically throughout the analytical run in order to verify whether significant instrument drift has occurred near the reporting limit.	Every ten samples or as specified in the analytical method.

CONTROL SPIKES

Laboratory Fortified Blank	LFB	The LFB is an aliquot of reagent water or blank matrix spiked with a known amount of one or more target analytes; it is derived from a certified secondary source standard. This blank spike is required for each analytical method that includes a sample preparation step (digestion, distillation, extraction, etc.). The purpose of the blank spike is to verify the accuracy of the analyst's spiking technique, determine if the preparation batch is in control independent of field sample matrix, and to aid in the assessment of any matrix interference encountered during the analysis of the matrix spike and matrix spike duplicate, or laboratory duplicate.	One per QC batch, not to exceed twenty (20) field investigative samples
Laboratory Control Sample	LCS	The LCS is otherwise an LFB for analyses in which no sample pretreatment is employed.	One per QC batch, not to exceed twenty (20) field investigative samples.

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QUALITY CONTROL SAMPLE TYPES

CALIBRATION AND REPORTING LIMIT VERIFICATION

Type	Abbr.	Description	Frequency
Initial Calibration Verification	ICV	The ICV is a mid-range standard from a certified secondary source analyzed to assess the integrity of the primary standards used for calibration.	Once per initial calibration or as specified in the analytical method.
Continuing Calibration Verification	CCV	The CCV is a mid-range primary source standard analyzed as a sample and compared with the standard curve. Evaluation of the CCV will determine if instrument response since the last CCV has remained within acceptance limits.	Analyzed after the initial calibration and/or ICV, after every 10 samples, and at the conclusion of the analytical run - or as specified in the analytical method.
Contract Required Detection Limit	CRDL	A primary source standard containing target analytes, each at a concentration equal to or near the reporting limit, analyzed to demonstrate that the reporting limit can be met within a specified recovery criterion.	Once per initial calibration or as specified in the analytical method (applicable to inorganic analyses such a metals).

MATRIX SPIKES, LABORATORY DUPLICATES, AND SURROGATES

Matrix Spike	SPK	The SPK is an aliquot of sample spiked with a known amount of a primary reference standard containing some or all of the analytes of interest. The purpose of the SPK is to monitor sample matrix effects on analytical accuracy; otherwise known as MS and MSD.	For organics and metals, one pair of matrix spikes for every 20 samples of each matrix type. For wet chemistry parameters, one matrix spike and one laboratory duplicate per 20 samples of each matrix type may be substituted.
Matrix Spike Duplicate	MSD	The MSD is the calculated relative percent difference (RPD) between the concentrations found from matrix spike pair or laboratory duplicate analyses.	One calculated RPD value per matrix spike or laboratory duplicate pair.
Sample Duplicate	DUP	The DUP is a replicate analysis of a particular sample that has been analyzed previously, usually within the sample analytical batch.	Every 10 samples of each matrix type or every 20 samples if combined with a matrix spike.
Surrogate Spike	SUR	Surrogates are brominated, fluorinated, isotopically labeled, or similar compounds not typically detected in environmental samples. They are used to assess analytical efficiency by measuring the percent recovery from a fortified sample or control matrix.	For almost all organic analyses, surrogate compounds are added to every blank, sample, matrix spike, matrix spike duplicate, and standard.

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Statement of Data Qualifications

No statements were generated.

Data Review and Approval

All data was peer-reviewed by a second analyst and then by appropriate data management staff against laboratory quality control requirements and project specifications; it was then reviewed and approved by the group supervisor/manager prior to further review by the project chemist. All reviews were documented.

Data Deliverables

Preliminary Report

A preliminary report comprised of sample results and QC was provided to the Client via e-mail on January 21, 2005. In the preparation of the final deliverables, no revision to any data was found to be necessary.

Final Deliverables

The hardcopy data deliverables that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. Per Client request, raw data and additional instrument QC summaries have not been included. The same report on CD will be provided once the report has been reviewed by the Client.

The EDD, in GIS/Key format, is being issued separate from this hardcopy report.

Walt Roudebush, Project Chemist

2/3/05
Date

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	01/07/05 @ 13:38
Project:	Richmond, VA	Sampler:	J.D. Renne
	RFAAP	Received:	01/10/05 @ 08:35
		Prepared:	01/11/05 by MSSP
Submittal #:	**36440-26**	Prep. Method:	USEPA-1311
Submittal:	IDM January 7, 2005	Analyzed:	01/12/05 by JDM
	RFAAP SWMU 54	Anal. Method:	USEPA-8260B
Sample ID:	**54IDMI**	QC Batch:	103101 -111
Sample #:	**381082**	Anal. Batch:	227396
Matrix:	Solid Waste	Percent Solids:	n/a
Unit:	mg/L	Dilution Factor:	1

CAS Number	Volatile Organics	Analytical Result	Reporting Limit	MDL
71-43-2	Benzene	0.10 U	0.10	0.00672
56-23-5	Carbon Tetrachloride	0.10 U	0.10	0.0145
108-90-7	Chlorobenzene	0.10 U	0.10	0.0110
67-66-3	Chloroform	0.10 U	0.10	0.0125
107-06-2	1,2-Dichloroethane	0.10 U	0.10	0.0141
75-35-4	1,1-Dichloroethylene	0.10 U	0.10	0.0120
78-93-3	2-Butanone	5.0 U	5.0	0.236
127-18-4	Tetrachloroethene	0.10 U	0.10	0.0145
79-01-6	Trichloroethene	0.10 U	0.10	0.0119
75-01-4	Vinyl Chloride	0.10 U	0.10	0.0145

End of Analytical Report

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	01/07/05 @ 13:38
Project:	Richmond, VA	Sampler:	J.D. Renne
	RFAAP	Received:	01/10/05 @ 08:35
		Prepared:	01/12/05 by JEO
Submittal #:	**36440-26**	Prep. Method:	USEPA-3510C
Submittal:	IDM January 7, 2005	Analyzed:	01/18/05 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8270C
Sample ID:	**54IDMI**	QC Batch:	102833 -112
Sample #:	**381082**	Anal. Batch:	227570
Matrix:	Solid Waste	Percent Solids:	n/a
Unit:	mg/L	Dilution Factor:	1

CAS Number	TCLP Semivolatiles TCLP Pesticides	Analytical Result	Reporting Limit	MDL
106-46-7	1,4-Dichlorobenzene	0.0050 U	0.0050	0.000221
121-14-2	2,4-Dinitrotoluene	0.0050 U	0.0050	0.000105
118-74-1	Hexachlorobenzene	0.0050 U	0.0050	0.000102
87-68-3	Hexachlorobutadiene	0.0050 U	0.0050	0.000299
67-72-1	Hexachloroethane	0.0050 U	0.0050	0.000100
98-95-3	Nitrobenzene	0.0050 U	0.0050	0.000142
87-86-5	Pentachlorophenol	0.0050 U	0.0050	0.000258
88-06-2	2,4,6-Trichlorophenol	0.0050 U	0.0050	0.000178
95-95-4	2,4,5-Trichlorophenol	0.0050 U	0.0050	0.000122
95-48-7	2-Methylphenol	0.0050 U	0.0050	0.000325
108-39-4	3 & 4 Methylphenol	0.0050 U	0.0050	0.000530
110-86-1	Pyridine	0.0050 U	0.0050	0.000101
58-89-9	Lindane	0.0050 U	0.0050	0.000117
72-20-8	Endrin	0.0050 U	0.0050	0.000165
72-43-5	Methoxychlor	0.0050 U	0.0050	0.000146
57-74-9	Chlordane (technical)	0.0050 U	0.0050	0.000247
76-44-8	Heptachlor	0.0050 U	0.0050	0.0000902
1024-57-3	Heptachlor Epoxide	0.0050 U	0.0050	0.000131
8001-35-2	Toxaphene	0.50 U	0.50	0.000202

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	01/07/05 @ 13:38
Project:	Richmond, VA	Sampler:	J.D. Renne
	RFAAP	Received:	01/10/05 @ 08:35
		Prepared:	01/12/05 by PAK
Submittal #:	**36440-26**	Prep. Method:	USEPA-8151A
Submittal:	IDM January 7, 2005	Analyzed:	01/19/05 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8270C
Sample ID:	**54IDMI**	QC Batch:	102944 -112
Sample #:	**381082**	Anal. Batch:	227583
Matrix:	Solid Waste	Percent Solids:	n/a
Unit:	mg/L	Dilution Factor:	1

CAS Number	Herbicides	Analytical Result	Reporting Limit	MDL
93-72-1	2,4,5-TP (Silvex)	0.10 U	0.10	0.0089
94-75-7	2,4-D	0.10 U	0.10	0.0095

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	01/07/05 @ 13:38
Project:	Richmond, VA	Sampler:	J.D. Renne
	RFAAP	Received:	01/10/05 @ 08:35

Submittal #: **36440-26**
Submittal: IDM January 7, 2005
RFAAP SWMU 54
Sample ID: **54IDMI**
Sample #: **381082**
Matrix: Solid Waste Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Arsenic, TCLP	0.20 U	0.20	0.0580	mg/L	01/19/05	DWJ	USEPA-6010B
Barium, TCLP	1.17	0.40	0.00171	mg/L	01/20/05	KLVM	USEPA-6010B
Cadmium, TCLP	0.0115	0.010	0.00293	mg/L	01/19/05	DWJ	USEPA-6010B
Chromium, TCLP	0.080 U	0.080	0.00686	mg/L	01/19/05	DWJ	USEPA-6010B
Lead, TCLP	0.20 U	0.20	0.0360	mg/L	01/19/05	DWJ	USEPA-6010B
Mercury, TCLP	0.0004 U	0.0004	0.0000629	mg/L	01/20/05	JLTR	USEPA-7470A
Selenium, TCLP	0.30 U	0.30	0.0864	mg/L	01/19/05	DWJ	USEPA-6010B
Silver, TCLP	0.030 U	0.030	0.00891	mg/L	01/19/05	DWJ	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 01/07/05 @ 13:38
Sampler: J.D. Renne
Received: 01/10/05 @ 08:35

Submittal #: **36440-26**
Submittal: IDM January 7, 2005
RFAAP SWMU 54
Sample ID: **54IDMI**
Sample #: **381082**
Matrix: Solid Waste

Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
pH	7.74	0.1	0.1	pH Units	01/17/05	TAM	USEPA-9045C

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TriMatrix
Laboratories, Inc.

QUALITY CONTROL REPORT
SAMPLE DUPLICATE
USEPA CLP FORM 6

SDG No.	36440 -26	Matrix	WASTE
		Lab Sample No.	381082
Sample ID.	54IDMI	Units	pH Units

Analyte	Control Limit	Sample Result	Duplicate Result	RPD	M
pH	0 - 20	7.74	7.73	0	

000051

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Cart 6

500mL 250mL

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1240

Project Number	Project Name
21355035	SWMU 54 - RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.474.5449

Samplers: John Darren Renne

LAB: 36440-26

AIRBILL No:

Courier: FED EX

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL) 17	Ignitability (1010)	Corrosivity (9045C) 17	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54IDM1	01-07-05/13:38	T	X		5	F	n/a	2					331032					X		X			RFAAP- WELL TURNINGS INVESTIGATION DERIVED MATERIAL LOW HAZARD 54 IDM 1

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
John Renne	1/7/5 14:00				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time		
		John Sue	01-10-05 08:35		

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

0000117

TC 4

23-1

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING NON-CONFORMANCE REPORT

Client	Project-Submittal No.
RFAAP	36440-26
Receipt Log No: 23-1	Completed By (initials/date): DK 01-10-05
	Project Chemist: WDR

List non-conformance issues associated with this submittal in the chart below/left. Identify discrepancies between the COC and sample tags in the chart below/right. Add comments as needed. Give to Project Chemist for immediate action.

COC ID No.	Line No.	Type of Problem: Discrepancy	Missing Container	Broken Container	Label Missing / Incomplete	Label Illegible	Low Volume	Inappropriate Container	Headspace	Not Listed on COC	Preservation	COC: Sample Field ID	COC: Date Sampled	COC: Time Sampled	COC: Container Type	COC: Qty	Sample Tag: Sample Field ID	Sample Tag: Date Sampled	Sample Tag: Time Sampled	Sample Tag: Container Type	Sample Tag: Qty	LIMS Qualifiers entered for this sample
1240	1	X												13:36				13:40				

Comments:

500 mL soil jar was labled with 13:40 as time
Temperatures exceed 6° Shipped w/out Ice
See (attached) e-mail re: receipt temp.

Project Chemist (initials/date): WDR 1/10/05

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: RFAAP
Receipt Record Page/Line No.: 23-1
Project-Submittal No.: new / add to 36440-26
Project Chemist: CORR
Sample Nos.:

Coolers Received

Recorded by (initials/date): SHF 01-10-05

- [x] Cooler
- [ ] Box
- [ ] Other
- Qty Received: 1
- Thennometer Used: [x] IR Gun (#94) [ ] Digital Thermometer (#54) [ ] Other (#)
- [ ] See Additional Cooler Information Form

Cooler No. Time: Two 4C4

Custody Seals
- [ ] none
- [x] present / intact
- [ ] present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- [ ] loose ice / avg 2-3 containers
- [ ] bagged ice / avg 2-3 containers
- [ ] blue ice / avg 2-3 containers
- [x] none / avg 2-3 containers

Alternate Temperature Taken Via:
- [x] temperature blank (tb)
- [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	14.9	0	14.9
tb location: (representative) / in ice			
1	14.7	0	14.7
2	15.4	0	15.4
3			
Average °C			14.9

- [ ] Cooler ID on COC?
- [ ] VOC trip blank received?

Cooler No. Time:

Custody Seals
- [ ] none
- [ ] present / intact
- [ ] present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- [ ] loose ice / avg 2-3 containers
- [ ] bagged ice / avg 2-3 containers
- [ ] blue ice / avg 2-3 containers
- [x] none / avg 2-3 containers

Alternate Temperature Taken Via:
- [ ] temperature blank (tb)
- [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

- [ ] Cooler ID on COC?
- [ ] VOC trip blank received?

Cooler No. Time:

Custody Seals
- [ ] none
- [ ] present / intact
- [ ] present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- [ ] loose ice / avg 2-3 containers
- [ ] bagged ice / avg 2-3 containers
- [ ] blue ice / avg 2-3 containers
- [x] none / avg 2-3 containers

Alternate Temperature Taken Via:
- [ ] temperature blank (tb)
- [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

- [ ] Cooler ID on COC?
- [ ] VOC trip blank received?

Cooler No. Time:

Custody Seals
- [ ] none
- [ ] present / intact
- [ ] present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- [ ] loose ice / avg 2-3 containers
- [ ] bagged ice / avg 2-3 containers
- [ ] blue ice / avg 2-3 containers
- [x] none / avg 2-3 containers

Alternate Temperature Taken Via:
- [ ] temperature blank (tb)
- [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

- [ ] Cooler ID on COC?
- [ ] VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

- [ ] No COC received

N/A	Yes	No	
	[x]	[ ]	Chain of Custody Record(s)?
	[ ]		If No, COC initiated by
	[x]		Rec'd for Lab signed/date/time?
[ ]	[x]		Shipping Document?
[x]	[ ]		Other

COC ID Nos.: 1240

- [ ] TriMatrix
- [x] Other (name or ID#): RFAAP

Check COC for Accuracy

- [ ] No analysis requested

Yes	No	
[x]	[ ]	Sample ID matches COC?
[ ]	[x]	Sample date and time matches COC?
[x]		Container type completed on COC?
[x]	[ ]	All container types indicated are received?

Sample Condition Summary

- [ ] Non-TriMatrix containers, see Notes

N/A	Yes	No	
	[ ]	[x]	Broken containers/lids?
	[ ]	[x]	Missing or incomplete labels?
	[ ]	[x]	Illegible information on labels?
	[ ]	[x]	Low volume received?
	[ ]	[x]	Inappropriate containers received?
[x]	[ ]	[ ]	VOC vials have headspace?
[ ]	[ ]	[x]	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	[ ]	[x]	All sample temperatures ≤4° C?
[x]	[ ]		Completed Sample Preservation Verification Form?
[x]	[ ]		Samples preserved correctly?
[x]	[ ]		If "No", added orange tag?
[x]	[ ]		Received pre-preserved VOC soils?

- [ ] MeOH
- [ ] Na_2SO_4

Check for Short Hold-Time Prep/Analyses

- [ ] Bacteriological
- [ ] Air Bags
- [ ] EnCores
- [ ] Formaldehyde/Aldehyde
- [ ] Green-tagged Containers
- [ ] Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
- [ ] NONE RECEIVED
- [ ] RECEIVED, COCs TO LAB(S)

Notes

- [ ] Trip blank received
- [ ] Trip blank not listed on COC
- [ ] No COC received, Proj. Chemist reviewed (init./date)
- [ ] No analysis requested, Proj. Chemist completed (init./date)

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
01-10-05 08:35	01-10-05 08:48	(Yes) / No

TRIMATRIX LABORATORIES, INC.
SUMMARY DATA PACKAGE

PREPARED FOR:

URS Group, Inc.
5540 Falmouth Street, Suite 201
Richmond, VA 23229

FOR THE SITE:

Radford Army Ammunition Plant
SWMU54 IDM

SDG-36440-34

January 30, 2007

Submitted by:

TriMatrix Laboratories, Inc.

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Individual sample results relate only to the sample tested.

SDG CASE NARRATIVE

URS Group, Inc.
Radford Army Ammunition Plant
SWMU54 IDM

SDG – 36440-34
JANUARY 30, 2007

This case narrative is applicable to the IDM sample collected from SWMU54 at Radford Army Ammunition Plant (the Site), Radford, Virginia by URS Group, Inc. (the Client) and received by TriMatrix Laboratories, Inc. (TriMatrix) on January 17, 2007. The sample was assigned to TriMatrix project sample delivery group (SDG) 36440-34 for analytical services (the Project) to be performed according to:

a) URS Project #11656351.30013, Subcontract # NCA-06-1783,

b) the Scope of Work (SOW) for the above,

c) Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006 (by reference)

d) any verbal and written correspondence between the Client and TriMatrix as the Project progressed.

No part of this Project was subcontracted.

Field Sample and Assigned Laboratory Sample ID Summary

For the sample received, a field sample to laboratory sample ID cross-reference table follows.

Field Sample Name	Sample Matrix	Laboratory Sample ID	Date Sampled	Date Received
IDM-1	Soil	0701258-01	01/17/07	01/18/07
IDM-1	Soil	0701258-02	01/17/07	01/18/07

Note: the 'IDM' sample was assigned two different laboratory sample IDs depending upon the matrix of the parameters to be reported (i.e., "TCLP" or "Waste").

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Sample Receipt and Log-in

On January 18, 2007 at 08:35 hrs, one sample cooler containing an IDM soil sample was received at TriMatrix via FedEx (the carrier). The cooler had been shipped from the Site on January 17.

The external custody seal affixed to the cooler was intact. The samples were received on ice and in good condition. The receipt temperature of the interior of the cooler was measured via a 'temperature blank' shipped in it; the measured temperature, in °C, was 5.2.

Shipping documents included one field chain-of-custody (COC) and associated carrier air bill.

The sample was not designated by the Client for MS/MSD analysis.

Samples were assigned to Work Order 0701258 and SDG 36440-34.

Copies of all referenced receipt and custody documents are provided in Section A of this data package. Correspondence regarding completed sample log-in activities will be found in Attachment 1 of this narrative.

Provision of Sample Receipt Information to Client

A copy of the COCs and receipt checklist were transmitted to the Client within one day of sample receipt. The Client did not request any modification(s) to the analyses, as listed on the COC.

Post-Receipt Sample Custody

Custody of the sample during sample preparation (if applicable) and analysis was assigned to individual analysts. Copies of completed 'internal chain of custody' forms are included in Section A.

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Variances

Data Qualifier Flags

Data qualifier flags other than those listed in the DoD QSM were employed or the definition of an existing flag was modified.

J – Estimated: the analyte was detected at a concentration greater than the limit of detection (i.e., MDL) but less than the reporting limit (i.e., MRL).

B – Blank contamination: The analyte was detected above one-half the reporting limit in an associated method blank. The same analyte in the sample was detected at less than five times the method blank concentration. (If a common laboratory contaminant is present in the method blank at a concentration greater than one-half the reporting limit but less than or equal to that reporting limit, any associated sample results are flagged but corrective action is not necessarily taken. A text qualifier is also associated with such a result.)

E – Exceeds calibration range: The analyte response exceeded the calibrated range of the instrument. (With the exception of metals for which only the final non-qualified result is reported, both the initial E-qualified result and final non-qualified result from reanalysis-at-dilution are reported.)

Text Qualifier

A LIMS-generated text qualifier is substituted for many instances in which the DoD QSM "Q" flag would otherwise apply. The text qualifiers are listed in a summary format by parameter with applicable samples identified.

Method 6010B

The acceptance criterion of < 2 x RL was substituted for < 2 x MDL for interference check solution ICS-A.

Analytical Methods

Sample preparation and analytical methods that were employed are per the SOW.

Method Detection Limits, Target Analytes, and Reporting Limits

All method detection limits (MDL) for analytes in this report are compliant with the DoD QSM specification that each reporting limit (RL) employed is to be at least three times the MDL. In addition, no RL is less than the equivalent concentration of the lowest instrument calibration standard. The target analyte list was specified by the Client in the SOW. Proposed RLs for non-TCLP parameters were submitted by TriMatrix to the Client prior to the receipt of any samples. TCLP parameters employ TriMatrix default RLs.

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Project-specific Analytes of Concern

No project-specific analytes of concern were identified in the SOW.

Quality Control Limits

Where applicable, quality control limits specified in the DoD QSM were employed. TriMatrix does not consider DoD QSM water limits to be applicable to a TCLP (leachate) matrix and internal laboratory limits were employed for TCLP parameters.

Hold Times

All samples were extracted/digested (where applicable) and analyzed within hold time.

Technical Issues

There were no technical issues.

Sample Result Reporting Convention

Sample results are reported as RL 'U' (e.g., 0.001 U) if the target analyte was not detected above the MDL. If a sample for an organic parameter is reanalyzed and also reported, the second analysis includes the suffix 'REn' where n = the first, second, etc. reanalysis. If a sample for an organic parameter is reanalyzed for confirmation purposes and also reported, the second analysis includes the suffix 'RE1'.

Data Qualifier Designation

If applicable, a sample result is qualified with:

- a "U" flag if the analyte was not detected at a concentration greater than the MDL,
- a "B", "J", and/or an "E" flag as defined in the preceding Variance section,
- a LIMS-generated statement of qualification. Qualifying statements, if any, will be found in Attachment 2 to this narrative.

QC Batch and Analytical Batch Designation

A QC Batch is a seven digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation); it is limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.).

An Analytical Batch (or Sequence) is a seven digit number that associates all samples analyzed as a set under one analytical sequence.

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Data Review and Approval

All data was reviewed and approved by the group supervisor/manager prior to further review by data management staff and the project chemist.

Data Deliverables

The data deliverables, both hardcopy and electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD has been issued separate from this hardcopy report.

Walt Roudebush, Project Chemist

1/30/07
Date

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Individual sample results relate only to the sample tested.

ORGANIC ANALYSIS DATA SHEET
USEPA-8260B

IDM

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-34 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: TCLP Laboratory ID: 0701258-02 File ID: 25801.D

Sampled: 01/17/07 16:45 Prepared: 01/23/07 08:00 Analyzed: 01/23/07 13:57

Solids: Preparation: 5030B Aqueous Purge & Initial/Final: 5 g / 5 mL

QC Batch: 0700760 Sequence: 7012410 Calibration: 7A24008 Instrument: 224

CAS No.	Analyte	Dilution	CONC. (mg/L)	MRL	MDL	Q
71-43-2	Benzene, TCLP	100	0.10	0.10	0.0065	U
56-23-5	Carbon Tetrachloride, TCLP	100	0.10	0.10	0.0081	U
108-90-7	Chlorobenzene, TCLP	100	0.10	0.10	0.011	U
67-66-3	Chloroform, TCLP	100	0.10	0.10	0.017	U
107-06-2	1,2-Dichloroethane, TCLP	100	0.10	0.10	0.0086	U
75-35-4	1,1-Dichloroethene, TCLP	100	0.10	0.10	0.013	U
78-93-3	2-Butanone (MEK), TCLP	100	5.0	5.0	0.057	U
127-18-4	Tetrachloroethene, TCLP	100	0.10	0.10	0.013	U
79-01-6	Trichloroethene, TCLP	100	0.10	0.10	0.014	U
75-01-4	Vinyl Chloride, TCLP	100	0.10	0.10	0.015	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
Dibromofluoromethane, TCLP	40.0	39.6	99	79 - 124	
1,2-Dichloroethane-d4, TCLP	40.0	40.7	102	75 - 128	
Toluene-d8, TCLP	40.0	41.6	104	87 - 113	
4-Bromofluorobenzene, TCLP	40.0	39.8	100	70 - 121	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Fluorobenzene, TCLP	731067	5.16	779878	5.15	
Chlorobenzene-d5, TCLP	660721	8.09	703454	8.09	
1,4-Dichlorobenzene-d4, TCLP	335315	10.39	383970	10.39	

* Values outside of QC limits

66626

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

IDM

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-34 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: TCLP Laboratory ID: 0701258-02 File ID: 70125802.D

Sampled: 01/17/07 16:45 Prepared: 01/19/07 08:00 Analyzed: 01/19/07 20:00

Solids: Preparation: 3510C TCLP Liquid-Liqu Initial/Final: 1000 mL / 10 mL

QC Batch: 0700597 Sequence: 7012211 Calibration: 6H23010 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (mg/L)	MRL	MDL	Q
106-46-7	1,4-Dichlorobenzene, TCLP	1	0.0050	0.0050	0.0000070	U
121-14-2	2,4-Dinitrotoluene, TCLP	1	0.0050	0.0050	0.0000035	U
118-74-1	Hexachlorobenzene, TCLP	1	0.0050	0.0050	0.0000055	U
87-68-3	Hexachlorobutadiene, TCLP	1	0.0050	0.0050	0.0000095	U
67-72-1	Hexachloroethane, TCLP	1	0.0050	0.0050	0.000012	U
98-95-3	Nitrobenzene, TCLP	1	0.0050	0.0050	0.0000060	U
110-86-1	Pyridine, TCLP	1	0.050	0.050	0.0015	U
87-86-5	Pentachlorophenol, TCLP	1	0.0050	0.0050	0.000038	U
88-06-2	2,4,6-Trichlorophenol, TCLP	1	0.0050	0.0050	0.0000075	U
95-95-4	2,4,5-Trichlorophenol, TCLP	1	0.0050	0.0050	0.0000070	U
95-48-7	2-Methylphenol, TCLP	1	0.0050	0.0050	0.0000035	U
108-39-4	3-Methylphenol, TCLP	1	0.0050	0.0050	0.000032	U
106-44-5	4-Methylphenol, TCLP	1	0.0050	0.0050	0.000032	U
58-89-9	gamma-BHC (lindane), TCLP	1	0.0050	0.0050	0.00050	U
72-20-8	Endrin, TCLP	1	0.0050	0.0050	0.00050	U
72-43-5	Methoxychlor, TCLP	1	0.0050	0.0050	0.00050	U
57-74-9	Technical Chlordane, TCLP	1	0.0050	0.0050	0.00050	U
76-44-8	Heptachlor, TCLP	1	0.0050	0.0050	0.00050	U
1024-57-3	Heptachlor Epoxide, TCLP	1	0.0050	0.0050	0.00050	U
8001-35-2	Toxaphene, TCLP	1	0.50	0.50	0.0010	U

System Monitoring Compound	ADDED (mg/L)	CONC (mg/L)	% REC.	QC Limits	Q
2-Fluorophenol, TCLP	0.200	0.113	57	30 - 104	
Phenol-d6, TCLP	0.200	0.0653	33	25 - 109	
Nitrobenzene-d5, TCLP	0.100	0.0863	86	20 - 140	
2-Fluorobiphenyl, TCLP	0.100	0.100	100	35 - 130	
2,4,6-Tribromophenol, TCLP	0.201	0.154	77	23 - 109	
o-Terphenyl, TCLP	0.100	0.116	116	34 - 130	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4, TCLP	52851	7.26	65154	7.26	
Naphthalene-d8, TCLP	191676	10.01	251665	10.01	
Acenaphthene-d10, TCLP	105204	14.12	133989	14.13	
Phenanthrene-d10, TCLP	134732	17.6	201431	17.61	
Chrysene-d12, TCLP	101864	21.29	171994	21.3	
Perylene-d12, TCLP	80375	22.91	128345	22.91	

* Values outside of QC limits

00643

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

IDM

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-34 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: TCLP Laboratory ID: 0701258-02 File ID: 70125801.D

Sampled: 01/17/07 16:45 Prepared: 01/19/07 07:58 Analyzed: 01/22/07 16:40

Solids: Preparation: 8151A Extraction Initial/Final: 500 g / 5 mL

QC Batch: 0700596 Sequence: 7012239 Calibration: 6H23012 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (mg/L)	MRL	MDL	Q
94-75-7	2,4-D, TCLP	1	0.10	0.10	0.0040	U
93-72-1	2,4,5-TP (Silvex), TCLP	1	0.10	0.10	0.0040	U

System Monitoring Compound	ADDED (mg/L)	CONC (mg/L)	% REC.	QC Limits	Q
2,4,5-T, TCLP	0.202	0.180	89	50 - 150	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
Phenanthrene-d10, TCLP	2148410	17.6	1686706	17.6	

* Values outside of QC limits

00044

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

IDM

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-34 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701258-01 File ID: data037-0

Sampled: 01/17/07 16:45 Prepared: 01/18/07 16:34 Analyzed: 01/20/07 10:31

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700435 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.21	2.5	0.20	J
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.9	2.5	0.051	
121-14-2	2,4-Dinitrotoluene	1	0.23	2.5	0.073	J
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.78	2.5	0.088	J
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.79	2.5	0.053	J
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	1.6	2.5	0.17	J

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	3.07	123	57 - 139	

* Values outside of QC limits

00077

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

IDM

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-34 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701258-01RE1 File ID: data009-20070123-164951-0

Sampled: 01/17/07 16:45 Prepared: 01/18/07 16:34 Analyzed: 01/23/07 16:49

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700435 Sequence: 7012353 Calibration: 6L18005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.22	2.5	0.20	J
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.8	2.5	0.051	
121-14-2	2,4-Dinitrotoluene	1	0.32	2.5	0.073	J
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.90	2.5	0.088	J
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.90	2.5	0.053	J
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	1.7	2.5	0.17	J

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.56	102	57 - 139	

* Values outside of QC limits

60078

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DRAFT: IDM

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: TCLP
Sampled: 01/17/07 16:45
Solids: 0.00
Laboratory ID: 0701258-02

SDG: 36440-34
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3010A TCLP Digestion
Prepared: 01/19/07 07:00
Initial/Final: 25 mL / 25 mL
QC Batch: 0700575

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, TCLP	0.070	mg/L	1	0.10	0.047	J	01/26/07 09:28
7440-39-3	Barium, TCLP	0.88	mg/L	1	0.35	0.00092		01/26/07 09:26
7440-43-9	Cadmium, TCLP	0.010	mg/L	1	0.010	0.0028	U	01/26/07 09:28
7440-47-3	Chromium, TCLP	0.050	mg/L	1	0.050	0.0055	U	01/26/07 09:28
7439-92-1	Lead, TCLP	0.092	mg/L	1	0.050	0.022		01/26/07 09:28
7782-49-2	Selenium, TCLP	0.10	mg/L	1	0.10	0.042	U	01/26/07 09:28
7440-22-4	Silver, TCLP	0.010	mg/L	1	0.010	0.0047	U	01/26/07 09:28

00169

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

IDM

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: TCLP
Sampled: 01/17/07 16:45
Solids: 0.00
Laboratory ID: 0701258-02

SDG: 36440-34
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7470A TCLP Digestion
Prepared: 01/22/07 13:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0700627

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, TCLP	0.00020	mg/L	1	0.00020	0.000039	U	01/23/07 09:10

INORGANIC ANALYSIS DATA SHEET
USEPA-9045C

IDM

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/17/07 16:45
Solids: 0.00
Laboratory ID: 0701258-01

SDG: 36440-34
Project: RFAAP SWMU 54 RFI/CMS
Preparation: General Inorganic Prep
Prepared: 01/19/07 09:54
Initial/Final: 20 g / 20 mL
QC Batch: 0700601

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	pH	5.9	pH Units	1	1.0	1.0		01/19/07 14:00

00138

DUPLICATES
USEPA-9045C

IDM

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
QC Batch: 0700601
Preparation: General Inorganic Prep
Source Sample Name: IDM

SDG: 36440-34
Project: RFAAP SWMU 54 RFI/CMS
Laboratory ID: 0700601-DUP1
Lab Source ID: 0701258-01
Initial/Final: 20 g / 20 mL
% Solids:

Analyte	Control Limit	Sample Conc.	C	Dup. Conc.	C	RPD %	Q	Method	Units
pH	20	5.87		5.93		1		USEPA-9045C	pH Units

* Values outside of QC limits

INORGANIC ANALYSIS DATA SHEET
USEPA-9095

IDM

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/17/07 16:45
Solids: 0.00
Laboratory ID: 0701258-01

SDG: 36440-34
Project: RFAAP SWMU 54 RFI/CMS
Preparation: General Inorganic Prep
Prepared: 01/22/07 09:11
Initial/Final: 102.64 g / 102.64 mL
QC Batch: 0700665

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Paint Filter Liquids Test	Pass	mL	1	1	1		01/22/07 09:11

DUPLICATES
USEPA-9095

IDM

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
QC Batch: 0700665
Preparation: General Inorganic Prep
Source Sample Name: IDM

SDG: 36440-34
Project: RFAAP SWMU 54 RFI/CMS
Laboratory ID: 0700665-DUP1
Lab Source ID: 0701258-01
Initial/Final: 102.02 g / 102.02 mL
% Solids:

Analyte	Control Limit	Sample Conc.	C	Dup. Conc.	C	RPD %	Q	Method	Units
Paint Filter Liquids Test	20	Pass		Pass				USEPA-9095	mL

* Values outside of QC limits

00150

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 117563

Page 1 of 1

For Lab Use Only
Cart 8
VOA Rack/Tray
Receipt Log No. 493
Project Chemist
Laboratory Project No. E0701258

Client Name: URS
Address: 5540 Falmouth St
Richmond VA 23230
Phone: 804-965-9000
Fax: 804-965-9764

Project Name: Sunoco 54 RFI
Client Project No. / P.O. No.
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Full TCLP Explosives 8330 SH Paint Filter 250mL

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted	Total	Sample Comments
											17		
30	SO	01	IDM		1/17/07	1645	X		SO		4	4	
31	SO	02											

Sampled By (print): John Spangler
Sampler's Signature:
Company: URS

How Shipped? Hand Carrier FedEx
Tracking No. 858913051768

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	18w	1/17/07						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Ziegler	1-18-07	8:35

TriMatrixCOC -- COC

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: URS
Receipt Record Page/Line No.: 49-3
Project-Submittal No.: new / add to E0701258
Project Chemist: Lisa
Sample Nos.:

Coolers Received

Recorded by (initials/date): KZ 1-18-07

☑ Cooler ☐ Box ☐ Other
Qty Received: 1
☑ IR Gun (#94) ☐ Digital Thermometer (#54) ☐ Other (#_____)
Thermometer Used
☐ See Additional Cooler Information Form

Cooler No.	Time	Custody Seals	Coolant Location	Coolant/Temperature Taken Via	Alternate Temperature Taken Via
—	9:15	☐ none ☑ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	5.2	—	5.2
tb location: representative / in ice			
1	6.8	—	6.8
2	6.2	—	6.2
3	7.0	—	7.0
Average °C			6.7

☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time	Custody Seals	Coolant Location	Coolant / Temperature Taken Via	Alternate Temperature Taken Via
		☐ none ☐ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time	Custody Seals	Coolant Location	Coolant / Temperature Taken Via	Alternate Temperature Taken Via
		☐ none ☐ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time	Custody Seals	Coolant Location	Coolant / Temperature Taken Via	Alternate Temperature Taken Via
		☐ none ☐ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

☐ Cooler ID on COC? ☐ VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by _____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☑	☐		Other _____

COC ID Nos.

☑ TriMatrix 117563

☐ Other (name or ID#)_____

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☐	Sample ID matches COC?
☑	☐	Sample date and time matches COC?
☑		Container type completed on COC?
☑	☐	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
		☑	Broken containers/lids?
		☑	Missing or incomplete labels?
		☑	Illegible information on labels?
		☑	Low volume received?
		☑	Inappropriate containers received?
☑		☐	VOC vials have headspace?
☑		☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☑	☐	Average sample temperature ≤6° C?
☑	☐		Completed Sample Preservation Verification Form?
☑	☐		Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores / Methanol Pre-Preserved
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

Metals ✓

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☑ RECEIVED, COCs TO LAB(S)

Notes

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) _____
☐ No analysis requested, Proj. Chemist completed (init./date) _____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
1-18-07 8:35	1-18-07 9:20	(Yes) No

APPENDIX C.8

SITE-SPECIFIC SSL CALCULATIONS

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AREA A SITE-SPECIFIC SSLs

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Site-Specific SSL(s) for gamma-BHC (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	5.15E-05	mg/L
C_w =	Target Leachate Conc =	6.18E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.100E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	3.38E+03	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	33.8	L/kg
	Site-specific SSL =	**2.103E-02**	**mg/kg**

Site-Specific SSL(s) for Heptachlor Epoxide (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	7.36E-06	mg/L
C_w =	Target Leachate Conc =	8.83E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	8.590E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	5.26E+03	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	52.6	L/kg
	Site-specific SSL =	**4.665E-03**	**mg/kg**

Site-Specific SSL(s) for Aroclor 1254 (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	3.35E-05	mg/L
C_w =	Target Leachate Conc =	4.02E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.160E-02	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	7.56E+04	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	756	L/kg
	Site-specific SSL =	**3.039E-01**	**mg/kg**

Site-Specific SSL(s) for Aroclor 1260 (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	3.35E-05	mg/L
C_w =	Target Leachate Conc =	4.02E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.370E-02	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.07E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	2,070	L/kg
	Site-specific SSL =	**8.319E-01**	**mg/kg**

Site-Specific SSL(s) for N-Nitrosodiphenylamine (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	1.37E-02	mg/L
C_w =	Target Leachate Conc =	1.64E-01	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	4.950E-05	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	6.15E+03	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	61.54	L/kg
	Site-specific SSL =	**1.013E+01**	**mg/kg**

Site-Specific SSL(s) for Acenaphthene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	3.70E-01	mg/L
C_w =	Target Leachate Conc =	4.44E+00	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	7.440E-03	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	6.12E+03	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	61.2	L/kg
	Site-specific SSL =	**2.727E+02**	**mg/kg**

Site-Specific SSL(s) for Benzo(a)anthracene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	3.00E-05	mg/L
C_w =	Target Leachate Conc =	3.60E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	4.910E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.31E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	2,310	L/kg
	Site-specific SSL =	**8.317E-01**	**mg/kg**

Site-Specific SSL(s) for Benzo(a)pyrene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	3.00E-06	mg/L
C_w =	Target Leachate Conc =	3.60E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.870E-05	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	7.87E+05	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	7,870	L/kg
	Site-specific SSL =	**2.833E-01**	**mg/kg**

Site-Specific SSL(s) for Benzo(b)fluoranthene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	3.00E-05	mg/L
C_w =	Target Leachate Conc =	3.60E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.69E-05	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	8.03E+05	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	8,030	L/kg
	Site-specific SSL =	**2.891E+00**	**mg/kg**

Site-Specific SSL(s) for Benzo(k)fluoranthene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	3.00E-05	mg/L
C_w =	Target Leachate Conc =	3.60E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.39E-05	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	7.87E+05	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	7,870	L/kg
	Site-specific SSL =	**2.833E+00**	**mg/kg**

Site-Specific SSL(s) for Dibenz(a,h)anthracene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	3.00E-06	mg/L
C_w =	Target Leachate Conc =	3.60E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	5.030E-06	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.62E+06	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	26,200	L/kg
	Site-specific SSL =	**9.432E-01**	**mg/kg**

Site-Specific SSL(s) for Ideno(1,2,3-cd)pyrene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	3.00E-05	mg/L
C_w =	Target Leachate Conc =	3.60E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.420E-05	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.68E+06	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	26800	L/kg
	Site-specific SSL =	**9.648E+00**	**mg/kg**

Site-Specific SSL(s) for Naphthalene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	6.50E-03	mg/L
C_w =	Target Leachate Conc =	7.80E-02	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.800E-02	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.84E+03	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.4	L/kg
	Site-specific SSL =	**1.452E+00**	**mg/kg**

Site-Specific SSL(s) for 1,3,5-Trinitrobenzene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	1.095	mg/L
C_w =	Target Leachate Conc =	13.14	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.260E-07	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1,087	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	10.87	L/kg
	Site-specific SSL =	**146.044**	**mg/kg**

Site-Specific SSL(s) for 2,4,6-TNT (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	0.00183	mg/L
C_w =	Target Leachate Conc =	0.02196	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.870E-05	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1,834	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.34	L/kg
	Site-specific SSL =	**0.408**	**mg/kg**

Site-Specific SSL(s) for DNT Mixture (50% 2,4-DNT, 50% 2,6-DNT) (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	0.00010	mg/L
C_w =	Target Leachate Conc =	0.00118	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.620E-05	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	371	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	3.714	L/kg
	Site-specific SSL =	**0.005**	**mg/kg**

Site-Specific SSL(s) for AminoDNTs (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	0.073	mg/L
C_w =	Target Leachate Conc =	0.876	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.610E-10	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	101	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.005	L/kg
	Site-specific SSL =	**1.095**	**mg/kg**

Site-Specific SSL(s) for HMX (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	1.825	mg/L
C_w =	Target Leachate Conc =	21.9	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.870E-05	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1,853	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.53	L/kg
	Site-specific SSL =	**411.16**	**mg/kg**

Site-Specific SSL(s) for Nitroglycerin (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	0.0037	mg/L
C_w =	Target Leachate Conc =	0.0444	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.040E-07	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	130.8	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.308	L/kg
	Site-specific SSL =	**0.069**	**mg/kg**

Site-Specific SSL(s) for 2,3,7,8-TCDD TEQ (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	4.46E-10	mg/L
C_w =	Target Leachate Conc =	5.36E-09	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.040E-03	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.46E+05	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1,460	L/kg
	Site-specific SSL =	**7.824E-06**	**mg/kg**

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Site-Specific SSL(s) for Aldrin (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	3.94E-06	mg/L
C_w =	Target Leachate Conc =	3.94E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.800E-03	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.06E+05	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1,060	L/kg
	Site-specific SSL =	**4.177E-02**	**mg/kg**

Site-Specific SSL(s) for alpha-BHC (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	1.06E-05	mg/L
C_w =	Target Leachate Conc =	1.06E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	4.990E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	3.38E+03	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	33.8	L/kg
	Site-specific SSL =	**3.617E-03**	**mg/kg**

Site-Specific SSL(s) for beta-BHC (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	3.72E-05	mg/L
C_w =	Target Leachate Conc =	3.72E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	4.990E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	3.38E+03	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	33.8	L/kg
	Site-specific SSL =	**1.266E-02**	**mg/kg**

Site-Specific SSL(s) for Dieldrin (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	4.20E-06	mg/L
C_w =	Target Leachate Conc =	4.20E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	4.090E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.06E+04	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	106	L/kg
	Site-specific SSL =	**4.461E-03**	**mg/kg**

Site-Specific SSL(s) for gamma-BHC (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	5.15E-05	mg/L
C_w =	Target Leachate Conc =	5.15E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.100E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	3.38E+03	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	33.8	L/kg
	Site-specific SSL =	**1.753E-02**	**mg/kg**

Site-Specific SSL(s) for Heptachlor Epoxide (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	7.36E-06	mg/L
C_w =	Target Leachate Conc =	7.36E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	8.590E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	5.26E+03	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	52.6	L/kg
	Site-specific SSL =	**3.887E-03**	**mg/kg**

Site-Specific SSL(s) for Aroclor 1254 (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	3.35E-05	mg/L
C_w =	Target Leachate Conc =	3.35E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.160E-02	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	7.56E+04	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	756	L/kg
	Site-specific SSL =	**2.532E-01**	**mg/kg**

Site-Specific SSL(s) for Aroclor 1260 (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	3.35E-05	mg/L
C_w =	Target Leachate Conc =	3.35E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.370E-02	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.07E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	2,070	L/kg
	Site-specific SSL =	**6.932E-01**	**mg/kg**

Site-Specific SSL(s) for Carbazole (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	3.35E-03	mg/L
C_w =	Target Leachate Conc =	3.35E-02	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	4.950E-05	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.13E+04	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	113	L/kg
	Site-specific SSL =	**3.791E+00**	**mg/kg**

Site-Specific SSL(s) for Diethylphlalate (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	2.92E+01	mg/L
C_w =	Target Leachate Conc =	2.92E+02	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.490E-05	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.26E+02	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.262	L/kg
	Site-specific SSL =	**4.327E+02**	**mg/kg**

Site-Specific SSL(s) for N-Nitrosodiphenylamine (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	1.37E-02	mg/L
C_w =	Target Leachate Conc =	1.37E-01	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	4.950E-05	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	6.15E+03	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	61.54	L/kg
	Site-specific SSL =	**8.441E+00**	**mg/kg**

Site-Specific SSL(s) for Benzo(a)anthracene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	3.00E-05	mg/L
C_w =	Target Leachate Conc =	3.00E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	4.910E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.31E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	2,310	L/kg
	Site-specific SSL =	**6.931E-01**	**mg/kg**

Site-Specific SSL(s) for Benzo(a)pyrene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	3.00E-06	mg/L
C_w =	Target Leachate Conc =	3.00E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.870E-05	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	7.87E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	7,870	L/kg
	Site-specific SSL =	**2.361E-01**	**mg/kg**

Site-Specific SSL(s) for Benzo(b)fluoranthene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	3.00E-05	mg/L
C_w =	Target Leachate Conc =	3.00E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.69E-05	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	8.03E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	8,030	L/kg
	Site-specific SSL =	**2.409E+00**	**mg/kg**

Site-Specific SSL(s) for 1,3,5-Trinitrobenzene (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	1.095	mg/L
C_w =	Target Leachate Conc =	10.95	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.260E-07	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1,087	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	10.87	L/kg
	Site-specific SSL =	**121.703**	**mg/kg**

Site-Specific SSL(s) for 2,4,6-TNT (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.00223	mg/L
C_w =	Target Leachate Conc =	0.02232	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.870E-05	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1,834	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.34	L/kg
	Site-specific SSL =	**0.415**	**mg/kg**

Site-Specific SSL(s) for DNT Mixture (50% 2,4-DNT, 50% 2,6-DNT) (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.00010	mg/L
C_w =	Target Leachate Conc =	0.00098	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.620E-05	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	371	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	3.714	L/kg
	Site-specific SSL =	**0.004**	**mg/kg**

Site-Specific SSL(s) for AminoDNTs (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.073	mg/L
C_w =	Target Leachate Conc =	0.730	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.610E-10	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	101	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.005	L/kg
	Site-specific SSL =	**0.912**	**mg/kg**

Site-Specific SSL(s) for HMX (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	1.825	mg/L
C_w =	Target Leachate Conc =	18.25	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.870E-05	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1,853	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.53	L/kg
	Site-specific SSL =	**342.634**	**mg/kg**

Site-Specific SSL(s) for RDX (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	0.00061	mg/L
C_w =	Target Leachate Conc =	0.00731	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.760E-06	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	104.5	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.045	L/kg
	Site-specific SSL =	**0.009**	**mg/kg**

Site-Specific SSL(s) for Nitroglycerin (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.00370	mg/L
C_w =	Target Leachate Conc =	0.03700	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.040E-07	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	130.8	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.308	L/kg
	Site-specific SSL =	**0.057**	**mg/kg**

Site-Specific SSL(s) for 2,3,7,8-TCDD TEQ (using C_w = T-RBC)
SWMU 54 RCRA Facility Investigation/Corrective Measures Study Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	4.46E-10	mg/L
C_w =	Target Leachate Conc =	4.46E-09	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.040E-03	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.46E+05	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1,460	L/kg
	Site-specific SSL =	**6.520E-06**	**mg/kg**

APPENDIX C.9

SOIL BACKGROUND EVALUATIONS

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Table C.9-1
Background Statistics - Area A - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

	Background Soil Data Set				Area A Surface Soil Data Set										
Parameter	**Detection Frequency**	**Mean**	**Median**	**Distribution**	**Detection Frequency**	**Mean**	**Median**	**Distribution**	**F-Test P-Value**	**F-test Result**	**Background Test Used**	**P-value**	**W Stat**	**W Crit**	**Site > Bkgd**
Aluminum	28/28	8,300	6,705	Lognormal	25/25	11,408	10,700	Normal	--		Mann-Whitney	0.0009	851.5		**Yes**
Antimony	0/14	--	--	Non-Parametric	13/22	0.4076	0.4250	Non-Parametric	--		Mann-Whitney	<0.0001	528.0		**Yes**
Arsenic	28/28	3.732	2.750	Lognormal	25/25	1.3296	1.3000	Normal	--		Mann-Whitney		356.0	675	No
Barium	24/28	64.85	58.65	Normal	25/25	136.80	142.00	Normal	0.024	Unequal	Mann-Whitney	<0.0001	944.0		**Yes**
Beryllium	15/28	0.4879	0.6150	Non-Parametric	25/25	0.7116	0.7400	Non-Parametric			Mann-Whitney	0.0291	781.5		**Yes**
Cadmium	2/28	0.0768	0.0200	Non-Parametric	6/25	0.2320	0.0300	Non-Parametric			Mann-Whitney	<0.0001	917.5		**Yes**
Calcium	23/28	984	762	Non-Parametric	25/25	3,020	1,700	Non-Parametric			Mann-Whitney	<0.0001	933.5		**Yes**
Chromium	28/28	21.09	22.40	Normal	25/25	18.932	18.100	Normal	0.000	Unequal	Mann-Whitney		633.5	675	No
Cobalt	20/28	11.53	10.15	Non-Parametric	25/25	8.164	7.800	Lognormal			Mann-Whitney		610.5	675	No
Copper	26/28	6.437	5.200	Normal	25/25	15.42	11.50	Lognormal			Mann-Whitney	0.0002	875.5		**Yes**
Iron	28/28	20,107	19,750	Normal	25/25	19,036	18,500	Normal	0.000	Unequal	Mann-Whitney		673.0	675	No
Lead	28/28	26.96	15.15	Non-Parametric	26/26	69.7	25.3	Lognormal			Mann-Whitney	0.0159	839.5		**Yes**
Magnesium	25/28	2,231	741	Non-Parametric	25/25	2,944	2,930	Normal			Mann-Whitney	<0.0001	896		**Yes**
Manganese	28/28	696	490	Lognormal	25/25	548.5	528.0	Normal			Mann-Whitney	0.3184	702		No
Mercury	3/28	0.0916	0.0600	Non-Parametric	25/25	0.0634	0.0430	Non-Parametric			Mann-Whitney		620	675	No
Nickel	17/28	6.43	5.55	Normal	25/25	10.924	10.900	Normal	0.000	Unequal	Mann-Whitney	0.0006	857.5		**Yes**
Potassium	22/28	625	318	Non-Parametric	25/25	1,176	1,120	Normal			Mann-Whitney	0.0001	893		**Yes**
Selenium	2/28	0.2475	0.1550	Non-Parametric	23/25	0.9730	1.0000	Non-Parametric			Mann-Whitney	<0.0001	936		**Yes**
Silver	2/28	0.371	0.180	Non-Parametric	3/25	0.0828	0.0800	Non-Parametric			Mann-Whitney		325	675	No
Sodium	1/28	18.54	11.70	Non-Parametric	21/25	170.4	177.0	Normal			Mann-Whitney	<0.0001	1014		**Yes**
Thallium	4/28	0.431	0.140	Non-Parametric	3/15	0.5020	0.5800	Non-Parametric			Mann-Whitney	0.0018	443		**Yes**
Vanadium	28/28	33.89	33.80	Lognormal	25/25	28.23	25.10	Lognormal			Mann-Whitney		615.5	675	No
Zinc	28/28	41.21	29.70	Lognormal	25/25	118.9	91.4	Lognormal			Mann-Whitney	<0.0001	955.5		**Yes**

Table C.9-2
Background Statistics - Area A - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

	Background Soil Data Set				Area A Total Soil Data Set										
Parameter	**Detection Frequency**	**Mean**	**Median**	**Distribution**	**Detection Frequency**	**Mean**	**Median**	**Distribution**	**F-Test P-Value**	**F-test Result**	**Background Test Used**	**P-value**	**W Stat**	**W Crit**	**Site > Bkgd**
Aluminum	79/79	14,128	11,900	Lognormal	50/50	11,420	10,850	Normal			Mann-Whitney		3129.0	3250	No
Antimony	0/38	--	--	Non-Parametric	25/43	0.502	0.430	Non-Parametric			Mann-Whitney	<0.0001	2362.0		**Yes**
Arsenic	76/79	4.686	3.200	Non-Parametric	49/50	1.2144	1.2500	Normal			Mann-Whitney		1574.0	3250	No
Barium	63/79	54.74	45.50	Non-Parametric	50/50	131.11	130.50	Normal			Mann-Whitney	<0.0001	4821.5		**Yes**
Beryllium	40/79	0.749	0.610	Non-Parametric	50/50	0.7275	0.7450	Non-Parametric			Mann-Whitney	0.051	3586.5		No
Cadmium	14/79	0.2188	0.0200	Non-Parametric	9/50	0.2234	0.0500	Non-Parametric			Mann-Whitney	<0.0001	4340.0		**Yes**
Calcium	63/79	1111	534	Non-Parametric	50/50	2459	1585	Non-Parametric			Mann-Whitney	<0.0001	4737.0		**Yes**
Chromium	79/79	27.08	26.20	Normal	50/50	18.653	18.100	Normal	0.000	Unequal	Mann-Whitney		2339.0	3250	No
Cobalt	57/79	16.34	11.40	Non-Parametric	50/50	8.279	8.150	Normal			Mann-Whitney		2771.5	3250	No
Copper	77/79	11.67	8.60	Non-Parametric	50/50	13.50	11.55	Lognormal			Mann-Whitney	0.0537	3583.5		No
Iron	79/79	26,980	25,200	Normal	50/50	18,516	17,950	Normal	0.000	Unequal	Mann-Whitney		2266.5	3250	No
Lead	79/79	22.23	12.50	Non-Parametric	52/52	46.5	11.3	Non-Parametric			Mann-Whitney	0.3420	3519.0		No
Magnesium	73/79	5,857	1,080	Non-Parametric	50/50	3,073	2,960	Lognormal			Mann-Whitney	0.0002	3976.0		**Yes**
Manganese	79/79	470.2	359.0	Lognormal	50/50	517.6	519.0	Normal			Mann-Whitney	0.0011	3886.5		**Yes**
Mercury	19/79	0.0796	0.0600	Non-Parametric	48/50	0.0613	0.0375	Non-Parametric			Mann-Whitney		2419.5	3250	No
Nickel	63/79	14.19	9.40	Non-Parametric	50/50	11.346	11.350	Normal			Mann-Whitney	0.1655	3451.5		No
Potassium	67/79	1476	618	Non-Parametric	50/50	1141.7	1100.0	Normal			Mann-Whitney	0.0033	3813.0		**Yes**
Selenium	2/79	0.2720	0.1700	Non-Parametric	46/50	0.9299	0.9950	Non-Parametric			Mann-Whitney	<0.0001	4695.0		**Yes**
Silver	2/79	0.2599	0.1900	Non-Parametric	6/50	0.08276	0.08000	Non-Parametric			Mann-Whitney		1275.0	3250	No
Sodium	6/79	23.88	12.10	Non-Parametric	46/50	169.9	168.0	Normal			Mann-Whitney	<0.0001	5103.5		**Yes**
Thallium	16/79	0.633	0.160	Non-Parametric	6/31	0.5058	0.5800	Non-Parametric			Mann-Whitney	0.0003	2237.5		**Yes**
Vanadium	79/79	46.13	41.40	Normal	50/50	27.42	25.35	Lognormal			Mann-Whitney		2044.5	3250	No
Zinc	79/79	54.71	29.80	Lognormal	50/50	90.87	65.80	Non-Parametric			Mann-Whitney	<0.0001	4456.5		**Yes**

Table C.9-3
Background Statistics - Area B - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

	Background Soil Data Set				Area B Surface Soil Data Set										
Parameter	**Detection Frequency**	**Mean**	**Median**	**Distribution**	**Detection Frequency**	**Mean**	**Median**	**Distribution**	**F-Test P-Value**	**F-test Result**	**Background Test Used**	**P-value**	**W Stat**	**W Crit**	**Site > Bkgd**
Aluminum	28/28	8,300	6,705	Lognormal	17/17	14,351	13,800	Normal	--		Mann-Whitney	<0.0001	563.5		**Yes**
Antimony	0/14	--	--	Non-Parametric	7/15	0.731	0.450	Non-Parametric	--		Mann-Whitney	<0.0001	330.0		**Yes**
Arsenic	28/28	3.732	2.750	Lognormal	17/17	1.565	1.200	Normal	--		Mann-Whitney		211.5	391	No
Barium	24/28	64.85	58.65	Normal	17/17	145.4	132.0	Normal	0.953	Equal	T-test	<0.0001			**Yes**
Beryllium	15/28	0.4879	0.6150	Non-Parametric	17/17	0.7774	0.7500	Normal			Mann-Whitney	0.0360	468.0		**Yes**
Cadmium	2/28	0.0768	0.0200	Non-Parametric	3/17	0.0982	0.0500	Non-Parametric			Mann-Whitney	<0.0001	570.5		**Yes**
Calcium	23/28	984	762	Non-Parametric	17/17	2,338	1,380	Non-Parametric			Mann-Whitney	0.0013	520.0		**Yes**
Chromium	28/28	21.09	22.40	Normal	17/17	22.34	20.80	Lognormal			Mann-Whitney	0.4166	400.5		No
Cobalt	20/28	11.53	10.15	Non-Parametric	17/17	8.776	8.500	Normal			Mann-Whitney		363.0	391	No
Copper	26/28	6.437	5.200	Normal	17/17	30.4	13.0	Lognormal			Mann-Whitney	0.0002	542.0		**Yes**
Iron	28/28	20,107	19,750	Normal	17/17	21,018	19,600	Normal	0.001	Unequal	Mann-Whitney	0.2636	418.5		No
Lead	28/28	26.96	15.15	Non-Parametric	17/17	357	30	Lognormal			Mann-Whitney	0.0518	461.0		No
Magnesium	25/28	2,231	741	Non-Parametric	17/17	3,454	3,140	Normal			Mann-Whitney	0.0002	541.0		**Yes**
Manganese	28/28	696	490	Lognormal	17/17	536.2	480.0	Normal			Mann-Whitney		389.0	391	No
Mercury	3/28	0.0916	0.0600	Non-Parametric	17/17	0.143	0.049	Lognormal			Mann-Whitney	0.2280	423.0		No
Nickel	17/28	6.43	5.55	Normal	17/17	12.462	12.400	Normal	0.007	Unequal	Mann-Whitney	0.0002	543.0		**Yes**
Potassium	22/28	625	318	Non-Parametric	17/17	1,678	1,610	Normal			Mann-Whitney	<0.0001	581.0		**Yes**
Selenium	2/28	0.2475	0.1550	Non-Parametric	17/17	1.317	1.250	Normal			Mann-Whitney	<0.0001	625.0		**Yes**
Silver	2/28	0.371	0.180	Non-Parametric	1/17	0.08882	0.08000	Non-Parametric			Mann-Whitney		153.0	391	No
Sodium	1/28	18.54	11.70	Non-Parametric	16/17	271.8	198.0	Lognormal			Mann-Whitney	<0.0001	626.0		**Yes**
Vanadium	28/28	33.89	33.80	Lognormal	17/17	35.43	33.40	Lognormal			Mann-Whitney	0.3496	408.0		No
Zinc	28/28	41.21	29.70	Lognormal	17/17	126.8	66.7	Non-Parametric			Mann-Whitney	<0.0001	577.5		**Yes**

Table C.9-4
Background Statistics - Area B - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

	Background Soil Data Set				Area B Total Soil Data Set										
Parameter	**Detection Frequency**	**Mean**	**Median**	**Distribution**	**Detection Frequency**	**Mean**	**Median**	**Distribution**	**F-Test P-Value**	**F-test Result**	**Background Test Used**	**P-value**	**W Stat**	**W Crit**	**Site > Bkgd**
Aluminum	79/79	14,128	11,900	Lognormal	37/37	12,843	12,800	Normal			Mann-Whitney	0.2358	2286.5		No
Antimony	0/38	--	--	Non-Parametric	13/30	1.242	0.430	Non-Parametric			Mann-Whitney	<0.0001	1600.5		**Yes**
Arsenic	76/79	4.686	3.200	Non-Parametric	36/37	1.364	1.100	Lognormal			Mann-Whitney		1051.5	2164.5	No
Barium	63/79	54.74	45.50	Non-Parametric	37/37	122.62	103.00	Lognormal			Mann-Whitney	<0.0001	3202.0		**Yes**
Beryllium	40/79	0.749	0.610	Non-Parametric	37/37	0.6795	0.6500	Normal			Mann-Whitney	0.2022		2304.5	No
Cadmium	14/79	0.2188	0.0200	Non-Parametric	4/37	0.0862	0.0400	Non-Parametric			Mann-Whitney	<0.0001	2915.5		**Yes**
Calcium	63/79	1111	534	Non-Parametric	37/37	2,549	1,200	Non-Parametric			Mann-Whitney	<0.0001	3021.0		**Yes**
Chromium	79/79	27.08	26.20	Normal	37/37	20.35	19.40	Lognormal			Mann-Whitney		1623.5	2164.5	No
Cobalt	57/79	16.34	11.40	Non-Parametric	37/37	7.932	7.5	Normal			Mann-Whitney		1785.5	2164.5	No
Copper	77/79	11.67	8.60	Non-Parametric	35/35	27.6	10.2	Lognormal			Mann-Whitney	0.2390	2128.5		No
Iron	79/79	26,980	25,200	Normal	37/37	19,691	19,300	Normal	0.000	Unequal	Mann-Whitney		1541.5	2164.5	No
Lead	79/79	22.23	12.50	Non-Parametric	37/37	251	11	Non-Parametric			Mann-Whitney		2043.5	2164.5	No
Magnesium	73/79	5,857	1,080	Non-Parametric	37/37	3,742	3,280	Non-Parametric			Mann-Whitney	0.0004	2730.0		**Yes**
Manganese	79/79	470.2	359.0	Lognormal	37/37	423.5	370.0	Normal			Mann-Whitney	0.1315	2354.0		No
Mercury	19/79	0.0796	0.0600	Non-Parametric	32/37	0.101	0.033	Non-Parametric			Mann-Whitney		1630.0	2164.5	No
Nickel	63/79	14.19	9.40	Non-Parametric	37/37	11.727	11.200	Normal			Mann-Whitney	0.1423	2345.5		No
Potassium	67/79	1,476	618	Non-Parametric	37/37	1,699	1,630	Normal			Mann-Whitney	<0.0001	2875.5		**Yes**
Selenium	2/79	0.2720	0.1700	Non-Parametric	37/37	1.1459	1.1000	Normal			Mann-Whitney	<0.0001	3563.0		**Yes**
Silver	2/79	0.2599	0.1900	Non-Parametric	2/37	0.08784	0.08000	Non-Parametric			Mann-Whitney		765.5	2164.5	No
Sodium	6/79	23.88	12.10	Non-Parametric	36/37	236.5	182.0	Non-Parametric			Mann-Whitney	<0.0001	3577.0		**Yes**
Vanadium	79/79	46.13	41.40	Normal	37/37	32.55	31.10	Normal	0.000	Unequal	Mann-Whitney		1493.5	2164.5	No
Zinc	79/79	54.71	29.80	Lognormal	37/37	102.4	53.7	Non-Parametric			Mann-Whitney	<0.0001	2900.5		**Yes**

Table C.9-5
Aluminum Site and Outside Fence Means Comparison - Area A - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean Less Than or Equal to Background Mean (Form 1)
Alternative Hypothesis	Site or AOC Mean Greater Than the Background Mean

Area of Concern Data: Aluminum(site)

Background Data: Aluminum(outside fence)

Raw Statistics

	Site	Background
Number of Valid Samples	25	12
Number of Distinct Samples	23	12
Minimum	6620	5900
Maximum	19400	17100
Mean	11408	12381
Median	10700	13200
SD	3576	3435
SE of Mean	715.2	991.5

Site vs Background Two-Sample t-Test

H0: Mu of Site - Mu of Background <= 0

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	35	-0.784	1.69	0.781
Satterthwaite (Unequal Variance)	22.6	-0.795	1.714	0.783

Pooled SD 3532.048

Conclusion with Alpha = 0.050

* Student t (Pooled) Test: Do Not Reject H0, Conclude Site <= Background
* Satterthwaite Test: Do Not Reject H0, Conclude Site <= Background

Test of Equality of Variances

Numerator DF	Denominator DF	F-Test Value	P-Value
24	11	1.084	0.929

Conclusion with Alpha = 0.05

* Two variances appear to be equal

Table C.9-6
Manganese Site and Outside Fence Means Comparison - Area A - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Manganese(site)

Background Data: Manganese(outside fence)

Raw Statistics

	Site	Background
Number of Valid Samples	50	36
Number of Distinct Samples	47	35
Minimum	220	224
Maximum	909	3710
Mean	517.6	981.2
Median	519	640
SD	135	843.1
SE of Mean	19.09	140.5

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1994
WMW Test U-Stat	-1.593
WMW Critical Value (0.050)	1.645
P-Value	0.944

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

APPENDIX C.10

EXPOSURE POINT CONCENTRATION STATISTICAL RESULTS

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Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Full Data Sets

User Selected Options

From File	P:\21355035 RFI Report (2007) SWMU 54\02_Deliverables\RFI Report 2007\Working Tables\Stats\ProUCL4.0\Area A
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ALUMINUM (mg/kg)

General Statistics

Number of Valid Samples	25	Number of Unique Samples	23

Raw Statistics		**Log-transformed Statistics**	
Minimum	6620	Minimum of Log Data	8.798
Maximum	19400	Maximum of Log Data	9.873
Mean	11408	Mean of log Data	9.296
Median	10700	SD of log Data	0.308
SD	3576		
Coefficient of Variation	0.313		
Skewness	0.653		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.936	Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12632	95% H-UCL	12816
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14520
95% Adjusted-CLT UCL	12684	97.5% Chebyshev (MVUE) UCL	15868
95% Modified-t UCL	12648	99% Chebyshev (MVUE) UCL	18516

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	9.764	Data appear Normal at 5% Significance Level	
Theta Star	1168		
nu star	488.2		
Approximate Chi Square Value (.05)	438	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	12585
Adjusted Chi Square Value	434.7	95% Jackknife UCL	12632
		95% Standard Bootstrap UCL	12581
Anderson-Darling Test Statistic	0.336	95% Bootstrap-t UCL	12790
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	12738
Kolmogorov-Smirnov Test Statistic	0.114	95% Percentile Bootstrap UCL	12653
Kolmogorov-Smirnov 5% Critical Value	0.174	95% BCA Bootstrap UCL	12664
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14526
		97.5% Chebyshev(Mean, Sd) UCL	15875
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18524
95% Approximate Gamma UCL	12717		
95% Adjusted Gamma UCL	12812		

Potential UCL to Use		Use 95% Student's-t UCL	12632

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	15
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.67	Minimum of Log Data	-0.4
Maximum	2.5	Maximum of Log Data	0.916
Mean	1.33	Mean of log Data	0.229
Median	1.3	SD of log Data	0.342
SD	0.464		
Coefficient of Variation	0.349		
Skewness	0.914		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.926	Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.488	95% H-UCL	1.516
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.733
95% Adjusted-CLT UCL	1.5	97.5% Chebyshev (MVUE) UCL	1.908
95% Modified-t UCL	1.491	99% Chebyshev (MVUE) UCL	2.252
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	8.018	Data appear Normal at 5% Significance Level	
Theta Star	0.166		
nu star	400.9		
Approximate Chi Square Value (.05)	355.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	1.482
Adjusted Chi Square Value	352.6	95% Jackknife UCL	1.488
		95% Standard Bootstrap UCL	1.477
Anderson-Darling Test Statistic	0.325	95% Bootstrap-t UCL	1.515
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	1.512
Kolmogorov-Smirnov Test Statistic	0.115	95% Percentile Bootstrap UCL	1.482
Kolmogorov-Smirnov 5% Critical Value	0.175	95% BCA Bootstrap UCL	1.498
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.734
		97.5% Chebyshev(Mean, Sd) UCL	1.909
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.253
95% Approximate Gamma UCL	1.499		
95% Adjusted Gamma UCL	1.512		
Potential UCL to Use		Use 95% Student's-t UCL	1.488

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CALCIUM (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	25
Raw Statistics		**Log-transformed Statistics**	
Minimum	1020	Minimum of Log Data	6.928
Maximum	21500	Maximum of Log Data	9.976
Mean	3020	Mean of log Data	7.662
Median	1700	SD of log Data	0.704
SD	4124		
Coefficient of Variation	1.365		
Skewness	4.08		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.467	Shapiro Wilk Test Statistic	0.827
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	4431	95% H-UCL	3715
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4469
95% Adjusted-CLT UCL	5096	97.5% Chebyshev (MVUE) UCL	5238
95% Modified-t UCL	4544	99% Chebyshev (MVUE) UCL	6750
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.407	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2147		
nu star	70.34		
Approximate Chi Square Value (.05)	52.03	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	4377
Adjusted Chi Square Value	50.96	95% Jackknife UCL	4431
		95% Standard Bootstrap UCL	4380
Anderson-Darling Test Statistic	2.419	95% Bootstrap-t UCL	7155
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	8926
Kolmogorov-Smirnov Test Statistic	0.263	95% Percentile Bootstrap UCL	4533
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	5299
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6615
		97.5% Chebyshev(Mean, Sd) UCL	8171
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11227
95% Approximate Gamma UCL	4083		
95% Adjusted Gamma UCL	4169		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6615

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	23
Raw Statistics		**Log-transformed Statistics**	
Minimum	12	Minimum of Log Data	2.485
Maximum	29.5	Maximum of Log Data	3.384
Mean	18.93	Mean of log Data	2.915
Median	18.1	SD of log Data	0.233
SD	4.458		
Coefficient of Variation	0.235		
Skewness	0.569		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.963	Shapiro Wilk Test Statistic	0.981
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	20.46	95% H-UCL	20.62
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22.82
95% Adjusted-CLT UCL	20.51	97.5% Chebyshev (MVUE) UCL	24.5
95% Modified-t UCL	20.47	99% Chebyshev (MVUE) UCL	27.8
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	17.01	Data appear Normal at 5% Significance Level	
Theta Star	1.113		
nu star	850.4		
Approximate Chi Square Value (.05)	783.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	20.4
Adjusted Chi Square Value	779.4	95% Jackknife UCL	20.46
		95% Standard Bootstrap UCL	20.32
Anderson-Darling Test Statistic	0.193	95% Bootstrap-t UCL	20.54
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	20.55
Kolmogorov-Smirnov Test Statistic	0.0853	95% Percentile Bootstrap UCL	20.43
Kolmogorov-Smirnov 5% Critical Value	0.174	95% BCA Bootstrap UCL	20.58
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.82
		97.5% Chebyshev(Mean, Sd) UCL	24.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	27.8
95% Approximate Gamma UCL	20.54		
95% Adjusted Gamma UCL	20.66		
Potential UCL to Use		Use 95% Student's-t UCL	20.46

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.8	Minimum of Log Data	1.758
Maximum	16	Maximum of Log Data	2.773
Mean	8.164	Mean of log Data	2.07
Median	7.8	SD of log Data	0.239
SD	2.197		
Coefficient of Variation	0.269		
Skewness	1.888		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.832	Shapiro Wilk Test Statistic	0.921
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.916	95% H-UCL	8.898
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.863
95% Adjusted-CLT UCL	9.064	97.5% Chebyshev (MVUE) UCL	10.61
95% Modified-t UCL	8.943	99% Chebyshev (MVUE) UCL	12.06
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	15.18	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.538		
nu star	758.8		
Approximate Chi Square Value (.05)	695.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	8.887
Adjusted Chi Square Value	691.8	95% Jackknife UCL	8.916
		95% Standard Bootstrap UCL	8.879
Anderson-Darling Test Statistic	0.546	95% Bootstrap-t UCL	9.191
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	9.75
Kolmogorov-Smirnov Test Statistic	0.104	95% Percentile Bootstrap UCL	8.932
Kolmogorov-Smirnov 5% Critical Value	0.174	95% BCA Bootstrap UCL	9.112
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.08
		97.5% Chebyshev(Mean, Sd) UCL	10.91
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.54
95% Approximate Gamma UCL	8.902		
95% Adjusted Gamma UCL	8.955		
Potential UCL to Use		Use 95% Approximate Gamma UCL	8.902

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COPPER (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	25
Raw Statistics		**Log-transformed Statistics**	
Minimum	3.9	Minimum of Log Data	1.361
Maximum	84.1	Maximum of Log Data	4.432
Mean	15.42	Mean of log Data	2.466
Median	11.5	SD of log Data	0.686
SD	15.81		
Coefficient of Variation	1.026		
Skewness	3.655		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.586	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	20.83	95% H-UCL	20.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.17
95% Adjusted-CLT UCL	23.09	97.5% Chebyshev (MVUE) UCL	28.26
95% Modified-t UCL	21.22	99% Chebyshev (MVUE) UCL	36.29
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.79	Data appear Lognormal at 5% Significance Level	
Theta Star	8.613		
nu star	89.51		
Approximate Chi Square Value (.05)	68.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	20.62
Adjusted Chi Square Value	67.46	95% Jackknife UCL	20.83
		95% Standard Bootstrap UCL	20.52
Anderson-Darling Test Statistic	0.884	95% Bootstrap-t UCL	26.79
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	41.63
Kolmogorov-Smirnov Test Statistic	0.207	95% Percentile Bootstrap UCL	21.07
Kolmogorov-Smirnov 5% Critical Value	0.177	95% BCA Bootstrap UCL	24.51
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	29.21
		97.5% Chebyshev(Mean, Sd) UCL	35.17
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	46.89
95% Approximate Gamma UCL	20.09		
95% Adjusted Gamma UCL	20.46		
Potential UCL to Use		Use 95% H-UCL	20.1

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	22
Raw Statistics		**Log-transformed Statistics**	
Minimum	13700	Minimum of Log Data	9.525
Maximum	27200	Maximum of Log Data	10.21
Mean	19036	Mean of log Data	9.833
Median	18500	SD of log Data	0.208
SD	4033		
Coefficient of Variation	0.212		
Skewness	0.53		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Test Statistic	0.95
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	20416	95% H-UCL	20528
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22505
95% Adjusted-CLT UCL	20454	97.5% Chebyshev (MVUE) UCL	24008
95% Modified-t UCL	20430	99% Chebyshev (MVUE) UCL	26961
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	21.17	Data appear Normal at 5% Significance Level	
Theta Star	899.3		
nu star	1058		
Approximate Chi Square Value (.05)	983.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	20363
Adjusted Chi Square Value	979	95% Jackknife UCL	20416
		95% Standard Bootstrap UCL	20333
Anderson-Darling Test Statistic	0.395	95% Bootstrap-t UCL	20527
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	20458
Kolmogorov-Smirnov Test Statistic	0.113	95% Percentile Bootstrap UCL	20352
Kolmogorov-Smirnov 5% Critical Value	0.174	95% BCA Bootstrap UCL	20440
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22552
		97.5% Chebyshev(Mean, Sd) UCL	24073
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	27061
95% Approximate Gamma UCL	20478		
95% Adjusted Gamma UCL	20580		
Potential UCL to Use		Use 95% Student's-t UCL	20416

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD (mg/kg)

General Statistics			
Number of Valid Samples	26	Number of Unique Samples	25
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.4	Minimum of Log Data	1.856
Maximum	528	Maximum of Log Data	6.269
Mean	69.72	Mean of log Data	3.473
Median	25.3	SD of log Data	1.127
SD	122.5		
Coefficient of Variation	1.757		
Skewness	3.108		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.519	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	110.8	95% H-UCL	110.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	124.4
95% Adjusted-CLT UCL	124.9	97.5% Chebyshev (MVUE) UCL	152.9
95% Modified-t UCL	113.2	99% Chebyshev (MVUE) UCL	208.8
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.709	Data appear Lognormal at 5% Significance Level	
Theta Star	98.34		
nu star	36.87		
Approximate Chi Square Value (.05)	23.97	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	109.2
Adjusted Chi Square Value	23.28	95% Jackknife UCL	110.8
		95% Standard Bootstrap UCL	107
Anderson-Darling Test Statistic	1.797	95% Bootstrap-t UCL	206.8
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	294.8
Kolmogorov-Smirnov Test Statistic	0.216	95% Percentile Bootstrap UCL	110.8
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	132.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	174.4
		97.5% Chebyshev(Mean, Sd) UCL	219.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	308.8
95% Approximate Gamma UCL	107.2		
95% Adjusted Gamma UCL	110.4		
Potential UCL to Use		Use 95% H-UCL	110.7

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MAGNESIUM (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	23
Raw Statistics		**Log-transformed Statistics**	
Minimum	1880	Minimum of Log Data	7.539
Maximum	5000	Maximum of Log Data	8.517
Mean	2944	Mean of log Data	7.958
Median	2930	SD of log Data	0.247
SD	755.4		
Coefficient of Variation	0.257		
Skewness	0.945		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Test Statistic	0.969
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	3202	95% H-UCL	3223
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3582
95% Adjusted-CLT UCL	3223	97.5% Chebyshev (MVUE) UCL	3859
95% Modified-t UCL	3207	99% Chebyshev (MVUE) UCL	4402
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	14.95	Data appear Normal at 5% Significance Level	
Theta Star	196.9		
nu star	747.7		
Approximate Chi Square Value (.05)	685.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	3193
Adjusted Chi Square Value	681.2	95% Jackknife UCL	3202
		95% Standard Bootstrap UCL	3190
Anderson-Darling Test Statistic	0.302	95% Bootstrap-t UCL	3249
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	3270
Kolmogorov-Smirnov Test Statistic	0.107	95% Percentile Bootstrap UCL	3188
Kolmogorov-Smirnov 5% Critical Value	0.174	95% BCA Bootstrap UCL	3197
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3603
		97.5% Chebyshev(Mean, Sd) UCL	3887
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4447
95% Approximate Gamma UCL	3212		
95% Adjusted Gamma UCL	3231		
Potential UCL to Use		Use 95% Student's-t UCL	3202

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	24
Raw Statistics		**Log-transformed Statistics**	
Minimum	309	Minimum of Log Data	5.733
Maximum	909	Maximum of Log Data	6.812
Mean	548.5	Mean of log Data	6.277
Median	528	SD of log Data	0.25
SD	143.6		
Coefficient of Variation	0.262		
Skewness	1.046		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.908	Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	597.7	95% H-UCL	601.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	668.8
95% Adjusted-CLT UCL	602.2	97.5% Chebyshev (MVUE) UCL	721
95% Modified-t UCL	598.7	99% Chebyshev (MVUE) UCL	823.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	14.55	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	37.69		
nu star	727.7		
Approximate Chi Square Value (.05)	666.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	595.8
Adjusted Chi Square Value	662.1	95% Jackknife UCL	597.7
		95% Standard Bootstrap UCL	594.8
Anderson-Darling Test Statistic	0.511	95% Bootstrap-t UCL	608.5
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	610.7
Kolmogorov-Smirnov Test Statistic	0.148	95% Percentile Bootstrap UCL	596.6
Kolmogorov-Smirnov 5% Critical Value	0.174	95% BCA Bootstrap UCL	604.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	673.7
		97.5% Chebyshev(Mean, Sd) UCL	727.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	834.3
95% Approximate Gamma UCL	599.2		
95% Adjusted Gamma UCL	602.9		
Potential UCL to Use		Use 95% Approximate Gamma UCL	599.2

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MERCURY (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	20
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.017	Minimum of Log Data	-4.075
Maximum	0.31	Maximum of Log Data	-1.171
Mean	0.0634	Mean of log Data	-3.028
Median	0.043	SD of log Data	0.645
SD	0.0671		
Coefficient of Variation	1.059		
Skewness	3.026		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.547	Shapiro Wilk Test Statistic	0.851
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0863	95% H-UCL	0.0785
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0943
95% Adjusted-CLT UCL	0.0941	97.5% Chebyshev (MVUE) UCL	0.11
95% Modified-t UCL	0.0877	99% Chebyshev (MVUE) UCL	0.14
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.795	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0353		
nu star	89.73		
Approximate Chi Square Value (.05)	68.89	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	0.0854
Adjusted Chi Square Value	67.64	95% Jackknife UCL	0.0863
		95% Standard Bootstrap UCL	0.0855
Anderson-Darling Test Statistic	2.426	95% Bootstrap-t UCL	0.137
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	0.188
Kolmogorov-Smirnov Test Statistic	0.258	95% Percentile Bootstrap UCL	0.0856
Kolmogorov-Smirnov 5% Critical Value	0.177	95% BCA Bootstrap UCL	0.0976
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.122
		97.5% Chebyshev(Mean, Sd) UCL	0.147
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.197
95% Approximate Gamma UCL	0.0825		
95% Adjusted Gamma UCL	0.084		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.122

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

VANADIUM (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	25
Raw Statistics		**Log-transformed Statistics**	
Minimum	16	Minimum of Log Data	2.773
Maximum	55.3	Maximum of Log Data	4.013
Mean	28.23	Mean of log Data	3.277
Median	25.1	SD of log Data	0.349
SD	11.09		
Coefficient of Variation	0.393		
Skewness	1.302		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.836	Shapiro Wilk Test Statistic	0.921
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	32.03	95% H-UCL	32.15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	36.84
95% Adjusted-CLT UCL	32.5	97.5% Chebyshev (MVUE) UCL	40.62
95% Modified-t UCL	32.12	99% Chebyshev (MVUE) UCL	48.05
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	7.158	Data appear Lognormal at 5% Significance Level	
Theta Star	3.944		
nu star	357.9		
Approximate Chi Square Value (.05)	315.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	31.88
Adjusted Chi Square Value	312.3	95% Jackknife UCL	32.03
		95% Standard Bootstrap UCL	31.76
Anderson-Darling Test Statistic	0.976	95% Bootstrap-t UCL	32.94
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	32.23
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	32.05
Kolmogorov-Smirnov 5% Critical Value	0.175	95% BCA Bootstrap UCL	32.39
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	37.9
		97.5% Chebyshev(Mean, Sd) UCL	42.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	50.29
95% Approximate Gamma UCL	32.07		
95% Adjusted Gamma UCL	32.35		
Potential UCL to Use		Use 95% Student's-t UCL	32.03
		or 95% Modified-t UCL	32.12
		or 95% H-UCL	32.15

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ZINC (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	25
Raw Statistics		**Log-transformed Statistics**	
Minimum	43.2	Minimum of Log Data	3.766
Maximum	337	Maximum of Log Data	5.82
Mean	118.9	Mean of log Data	4.619
Median	91.4	SD of log Data	0.555
SD	76.51		
Coefficient of Variation	0.644		
Skewness	1.717		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.806	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	145.1	95% H-UCL	148.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	177.1
95% Adjusted-CLT UCL	149.7	97.5% Chebyshev (MVUE) UCL	203
95% Modified-t UCL	145.9	99% Chebyshev (MVUE) UCL	253.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.924	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	40.66		
nu star	146.2		
Approximate Chi Square Value (.05)	119.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0395	95% CLT UCL	144.1
Adjusted Chi Square Value	117.6	95% Jackknife UCL	145.1
		95% Standard Bootstrap UCL	143.3
Anderson-Darling Test Statistic	0.608	95% Bootstrap-t UCL	154.6
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	162.4
Kolmogorov-Smirnov Test Statistic	0.134	95% Percentile Bootstrap UCL	144.1
Kolmogorov-Smirnov 5% Critical Value	0.176	95% BCA Bootstrap UCL	151.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	185.6
		97.5% Chebyshev(Mean, Sd) UCL	214.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	271.1
95% Approximate Gamma UCL	145.7		
95% Adjusted Gamma UCL	147.8		
Potential UCL to Use		Use 95% Approximate Gamma UCL	145.7

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,3,7,8-TCDD TEQ HH/Mammalian (pg/g)

General Statistics			
Number of Valid Samples	11	Number of Unique Samples	11
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0377	Minimum of Log Data	-3.277
Maximum	16.99	Maximum of Log Data	2.833
Mean	2.757	Mean of log Data	-0.508
Median	0.766	SD of log Data	2.024
SD	5.029		
Coefficient of Variation	1.824		
Skewness	2.692		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.604	Shapiro Wilk Test Statistic	0.951
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	5.506	95% H-UCL	132.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.86
95% Adjusted-CLT UCL	6.567	97.5% Chebyshev (MVUE) UCL	15.64
95% Modified-t UCL	5.711	99% Chebyshev (MVUE) UCL	23.07
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.372	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	7.419		
nu star	8.177		
Approximate Chi Square Value (.05)	2.838	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	5.252
Adjusted Chi Square Value	2.351	95% Jackknife UCL	5.506
		95% Standard Bootstrap UCL	5.086
Anderson-Darling Test Statistic	0.405	95% Bootstrap-t UCL	12.7
Anderson-Darling 5% Critical Value	0.795	95% Hall's Bootstrap UCL	14.77
Kolmogorov-Smirnov Test Statistic	0.171	95% Percentile Bootstrap UCL	5.307
Kolmogorov-Smirnov 5% Critical Value	0.272	95% BCA Bootstrap UCL	6.551
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.367
		97.5% Chebyshev(Mean, Sd) UCL	12.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.84
95% Approximate Gamma UCL	7.945		
95% Adjusted Gamma UCL	9.591		
Potential UCL to Use		Use 95% Adjusted Gamma UCL	9.591

Table C.10-1
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,3,7,8-TCDD TEQ AVIAN (pg/g)

General Statistics			
Number of Valid Samples	11	Number of Unique Samples	11
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0133	Minimum of Log Data	-4.317
Maximum	16.8	Maximum of Log Data	2.821
Mean	2.734	Mean of log Data	-1.096
Median	0.283	SD of log Data	2.453
SD	5.279		
Coefficient of Variation	1.931		
Skewness	2.36		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.598	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	5.619	95% H-UCL	851.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.35
95% Adjusted-CLT UCL	6.562	97.5% Chebyshev (MVUE) UCL	19.1
95% Modified-t UCL	5.807	99% Chebyshev (MVUE) UCL	28.44
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.296	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	9.229		
nu star	6.517		
Approximate Chi Square Value (.05)	1.91	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	5.352
Adjusted Chi Square Value	1.531	95% Jackknife UCL	5.619
		95% Standard Bootstrap UCL	5.232
Anderson-Darling Test Statistic	0.545	95% Bootstrap-t UCL	18.73
Anderson-Darling 5% Critical Value	0.815	95% Hall's Bootstrap UCL	17.6
Kolmogorov-Smirnov Test Statistic	0.254	95% Percentile Bootstrap UCL	5.598
Kolmogorov-Smirnov 5% Critical Value	0.275	95% BCA Bootstrap UCL	7.085
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.672
		97.5% Chebyshev(Mean, Sd) UCL	12.67
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.57
95% Approximate Gamma UCL	9.331		
95% Adjusted Gamma UCL	11.64		
Potential UCL to Use		Use 95% Adjusted Gamma UCL	11.64

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	P:\21355035 RFI Report (2007) SWMU 54\02_Deliverables\RFI Report 2007\Working Tables\Stats\ProUCL4.0\Area A
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

CADMIUM (mg/kg)

General Statistics

Number of Valid Samples	25	Number of Detected Data	6
Number of Unique Samples	6	Number of Non-Detect Data	19
		Percent Non-Detects	76.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.1	Minimum Detected	-2.303
Maximum Detected	1.6	Maximum Detected	0.47
Mean of Detected	0.837	Mean of Detected	-0.634
SD of Detected	0.671	SD of Detected	1.189
Minimum Non-Detect	0.03	Minimum Non-Detect	-3.507
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	19
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	6
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	76.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.851	Shapiro Wilk Test Statistic	0.861
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.216	Mean	-3.126
SD	0.469	SD	1.543
95% DL/2 (t) UCL	0.377	95% H-Stat (DL/2) UCL	0.368

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.128
		SD in Log Scale	2.519
		Mean in Original Scale	0.211
		SD in Original Scale	0.472
		95% Percentile Bootstrap UCL	0.378
		95% BCA Bootstrap UCL	0.424

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	0.73	**Data appear Normal at 5% Significance Level**
Theta Star	1.147	
nu star	8.757	
A-D Test Statistic	0.49	**Nonparametric Statistics**
5% A-D Critical Value	0.712	Kaplan-Meier (KM) Method
K-S Test Statistic	0.712	Mean 0.277
5% K-S Critical Value	0.339	SD 0.435
Data appear Gamma Distributed at 5% Significance Level		SE of Mean 0.0953
		95% KM (t) UCL 0.44
Assuming Gamma Distribution		95% KM (z) UCL 0.433
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL 0.407
Minimum	0.00937	95% KM (bootstrap t) UCL 0.448
Maximum	2.284	95% KM (BCA) UCL 1.328
Mean	0.983	95% KM (Percentile Bootstrap) UCL 0.64
Median	0.959	95% KM (Chebyshev) UCL 0.692
SD	0.71	97.5% KM (Chebyshev) UCL 0.872
k star	1.027	99% KM (Chebyshev) UCL 1.225
Theta star	0.957	
Nu star	51.33	**Potential UCLs to Use**
AppChi2	35.88	95% KM (t) UCL 0.44
95% Gamma Approximate UCL	1.406	95% KM (Percentile Bootstrap) UCL 0.64
95% Adjusted Gamma UCL	1.442	

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

SELENIUM (mg/kg)

General Statistics

Number of Valid Samples	25	Number of Detected Data	23
Number of Unique Samples	13	Number of Non-Detect Data	2
		Percent Non-Detects	8.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.057	Minimum Detected	-2.865
Maximum Detected	2	Maximum Detected	0.693
Mean of Detected	1.053	Mean of Detected	-0.0773
SD of Detected	0.394	SD of Detected	0.679
Minimum Non-Detect	0.0486	Minimum Non-Detect	-3.024
Maximum Non-Detect	0.0486	Maximum Non-Detect	-3.024

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.916	Shapiro Wilk Test Statistic	0.621
5% Shapiro Wilk Critical Value	0.914	5% Shapiro Wilk Critical Value	0.914
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.971	Mean	-0.368
SD	0.472	SD	1.2
95% DL/2 (t) UCL	1.133	95% H-Stat (DL/2) UCL	1.962
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.957	Mean in Log Scale	-0.17
SD	0.495	SD in Log Scale	0.726
95% MLE (t) UCL	1.127	Mean in Original Scale	0.992
95% MLE (Tiku) UCL	1.131	SD in Original Scale	0.432
		95% Percentile Bootstrap UCL	1.131
		95% BCA Bootstrap UCL	1.119
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	3.531	**Data appear Normal at 5% Significance Level**	
Theta Star	0.298		
nu star	162.4		
A-D Test Statistic	1.888	**Nonparametric Statistics**	
5% A-D Critical Value	0.749	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.749	Mean	0.974
5% K-S Critical Value	0.182	SD	0.458
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0936
		95% KM (t) UCL	1.134
Assuming Gamma Distribution		95% KM (z) UCL	1.128
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.131
Minimum	0.057	95% KM (bootstrap t) UCL	1.12
Maximum	2	95% KM (BCA) UCL	1.158
Mean	0.993	95% KM (Percentile Bootstrap) UCL	1.133
Median	1	95% KM (Chebyshev) UCL	1.382
SD	0.432	97.5% KM (Chebyshev) UCL	1.558
k star	2.843	99% KM (Chebyshev) UCL	1.905
Theta star	0.349		
Nu star	142.2	**Potential UCLs to Use**	
AppChi2	115.6	95% KM (t) UCL	1.134
95% Gamma Approximate UCL	1.22	95% KM (Percentile Bootstrap) UCL	1.133
95% Adjusted Gamma UCL	1.238		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

THALLIUM (mg/kg)

General Statistics			
Number of Valid Samples	25	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	22
		Percent Non-Detects	88.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.12	Minimum Detected	-2.12
Maximum Detected	0.2	Maximum Detected	-1.609
Mean of Detected	0.16	Mean of Detected	-1.854
SD of Detected	0.04	SD of Detected	0.256
Minimum Non-Detect	0.26	Minimum Non-Detect	-1.347
Maximum Non-Detect	0.64	Maximum Non-Detect	-0.446

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	25
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	0.995
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.214	Mean	-1.612
SD	0.0796	SD	0.39
95% DL/2 (t) UCL	0.241	95% H-Stat (DL/2) UCL	0.316

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.854
		SD in Log Scale	0.198
		Mean in Original Scale	0.16
		SD in Original Scale	0.0315
		95% Percentile Bootstrap UCL	0.169
		95% BCA Bootstrap UCL	0.17

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		

A-D Test Statistic	0.249	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.16
5% K-S Critical Value	N/A	SD	0.0327
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0231
		95% KM (t) UCL	0.2
Assuming Gamma Distribution		95% KM (z) UCL	0.198
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.207
Minimum	N/A	95% KM (bootstrap t) UCL	0.221
Maximum	N/A	95% KM (BCA) UCL	0.18
Mean	N/A	95% KM (Percentile Bootstrap) UCL	0.2
Median	N/A	95% KM (Chebyshev) UCL	0.261
SD	N/A	97.5% KM (Chebyshev) UCL	0.304
k star	N/A	99% KM (Chebyshev) UCL	0.39
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	0.2
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	0.2
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

4,4'-DDT (ug/kg)

General Statistics			
Number of Valid Samples	14	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	11
		Percent Non-Detects	78.57%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.1	Minimum Detected	0.742
Maximum Detected	26	Maximum Detected	3.258
Mean of Detected	10.73	Mean of Detected	1.804
SD of Detected	13.26	SD of Detected	1.303
Minimum Non-Detect	0.39	Minimum Non-Detect	-0.942
Maximum Non-Detect	3.07	Maximum Non-Detect	1.122
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	12
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	85.71%
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.812	Shapiro Wilk Test Statistic	0.932
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.881	Mean	0.0491
SD	6.729	SD	1.179
95% DL/2 (t) UCL	6.066	95% H-Stat (DL/2) UCL	2.851
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-2.204
		SD in Log Scale	2.574
		Mean in Original Scale	2.363
		SD in Original Scale	6.902
		95% Percentile Bootstrap UCL	5.895
		95% BCA Bootstrap UCL	8.332
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.399	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	3.95
5% K-S Critical Value	N/A	SD	6.137
Data not Gamma Distributed at 5% Significance Level		SE of Mean	2.009
		95% KM (t) UCL	7.508
Assuming Gamma Distribution		95% KM (z) UCL	7.254
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	6.649
Minimum	N/A	95% KM (bootstrap t) UCL	18.98
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	26
Median	N/A	95% KM (Chebyshev) UCL	12.71
SD	N/A	97.5% KM (Chebyshev) UCL	16.5
k star	N/A	99% KM (Chebyshev) UCL	23.94
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	7.508
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	26
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR 1254 (ug/kg)

General Statistics

Number of Valid Samples	14	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	11
		Percent Non-Detects	78.57%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	28	Minimum Detected	3.332
Maximum Detected	200	Maximum Detected	5.298
Mean of Detected	97.67	Mean of Detected	4.268
SD of Detected	90.53	SD of Detected	0.986
Minimum Non-Detect	6.8	Minimum Non-Detect	1.917
Maximum Non-Detect	9	Maximum Non-Detect	2.197

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	11
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	78.57%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Test Statistic	0.993
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	23.93	Mean	1.964
SD	53.46	SD	1.311
95% DL/2 (t) UCL	49.24	95% H-Stat (DL/2) UCL	24.78

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	0.354
		SD in Log Scale	2.434
		Mean in Original Scale	21.65
		SD in Original Scale	54.39
		95% Percentile Bootstrap UCL	47.36
		95% BCA Bootstrap UCL	66.24

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**
Theta Star	N/A	
nu star	N/A	

A-D Test Statistic	0.283	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	42.93
5% K-S Critical Value	N/A	SD	44.59
Data not Gamma Distributed at 5% Significance Level		SE of Mean	14.59
		95% KM (t) UCL	68.77
Assuming Gamma Distribution		95% KM (z) UCL	66.93
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	71.65
Minimum	N/A	95% KM (bootstrap t) UCL	79.31
Maximum	N/A	95% KM (BCA) UCL	200
Mean	N/A	95% KM (Percentile Bootstrap) UCL	200
Median	N/A	95% KM (Chebyshev) UCL	106.5
SD	N/A	97.5% KM (Chebyshev) UCL	134.1
k star	N/A	99% KM (Chebyshev) UCL	188.1
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	68.77
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	200
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DI-N-OCTYLPHTHALATE (ug/kg)

General Statistics

Number of Valid Samples	18	Number of Detected Data	7
Number of Unique Samples	7	Number of Non-Detect Data	11
		Percent Non-Detects	61.11%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	57	Minimum Detected	4.043
Maximum Detected	320	Maximum Detected	5.768
Mean of Detected	169.6	Mean of Detected	5.009
SD of Detected	86.48	SD of Detected	0.564
Minimum Non-Detect	380	Minimum Non-Detect	5.94
Maximum Non-Detect	420	Maximum Non-Detect	6.04

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	18
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.971	Shapiro Wilk Test Statistic	0.975
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	186.2	Mean	5.176
SD	53.36	SD	0.363
95% DL/2 (t) UCL	208.1	95% H-Stat (DL/2) UCL	223.4

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	5.009
		SD in Log Scale	0.457
		Mean in Original Scale	164.4
		SD in Original Scale	71.39
		95% Percentile Bootstrap UCL	191.9
		95% BCA Bootstrap UCL	191.5

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	2.479	**Data appear Normal at 5% Significance Level**	
Theta Star	68.39		
nu star	34.71		
A-D Test Statistic	0.156	**Nonparametric Statistics**	
5% A-D Critical Value	0.71	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.71	Mean	169.6
5% K-S Critical Value	0.313	SD	80.06
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	32.68
		95% KM (t) UCL	226.4
Assuming Gamma Distribution		95% KM (z) UCL	223.3
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	229.3
Minimum	57	95% KM (bootstrap t) UCL	246.6
Maximum	320	95% KM (BCA) UCL	219.6
Mean	172.1	95% KM (Percentile Bootstrap) UCL	221.3
Median	179.9	95% KM (Chebyshev) UCL	312
SD	70.19	97.5% KM (Chebyshev) UCL	373.7
k star	4.737	99% KM (Chebyshev) UCL	494.8
Theta star	36.33		
Nu star	170.5	**Potential UCLs to Use**	
AppChi2	141.3	95% KM (t) UCL	226.4
95% Gamma Approximate UCL	207.6	95% KM (Percentile Bootstrap) UCL	221.3
95% Adjusted Gamma UCL	211.4		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ACENAPHTHENE (ug/kg)

General Statistics			
Number of Valid Samples	13	Number of Detected Data	9
Number of Unique Samples	9	Number of Non-Detect Data	4
		Percent Non-Detects	30.77%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	33	Minimum Detected	3.497
Maximum Detected	1600	Maximum Detected	7.378
Mean of Detected	343.8	Mean of Detected	5.046
SD of Detected	505.3	SD of Detected	1.301
Minimum Non-Detect	5.9	Minimum Non-Detect	1.775
Maximum Non-Detect	5.9	Maximum Non-Detect	1.775
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.665	Shapiro Wilk Test Statistic	0.916
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	238.9	Mean	3.826
SD	443.9	SD	2.18
95% DL/2 (t) UCL	458.3	95% H-Stat (DL/2) UCL	1194
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	116.1	Mean in Log Scale	4.022
SD	551.2	SD in Log Scale	1.96
95% MLE (t) UCL	388.6	Mean in Original Scale	240.1
95% MLE (Tiku) UCL	401.6	SD in Original Scale	443.2
		95% Percentile Bootstrap UCL	466.5
		95% BCA Bootstrap UCL	578.6
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.576	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	596.5		
nu star	10.37		
A-D Test Statistic	0.619	**Nonparametric Statistics**	
5% A-D Critical Value	0.751	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.751	Mean	248.2
5% K-S Critical Value	0.289	SD	421.5
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	124
		95% KM (t) UCL	469.2
Assuming Gamma Distribution		95% KM (z) UCL	452.1
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	460.8
Minimum	0	95% KM (bootstrap t) UCL	809.6
Maximum	1600	95% KM (BCA) UCL	510
Mean	243.1	95% KM (Percentile Bootstrap) UCL	476.2
Median	66.25	95% KM (Chebyshev) UCL	788.7
SD	441.8	97.5% KM (Chebyshev) UCL	1023
k star	0.145	99% KM (Chebyshev) UCL	1482
Theta star	1671		
Nu star	3.782	**Potential UCLs to Use**	
AppChi2	0.637	95% KM (BCA) UCL	510
95% Gamma Approximate UCL	1442		
95% Adjusted Gamma UCL	1905		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ACENAPHTHYLENE (ug/kg)

General Statistics

Number of Valid Samples	18	Number of Detected Data	5
Number of Unique Samples	5	Number of Non-Detect Data	13
		Percent Non-Detects	72.22%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	22	Minimum Detected	3.091
Maximum Detected	1100	Maximum Detected	7.003
Mean of Detected	289.6	Mean of Detected	4.528
SD of Detected	463.9	SD of Detected	1.69
Minimum Non-Detect	5.9	Minimum Non-Detect	1.775
Maximum Non-Detect	51	Maximum Non-Detect	3.932

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	16
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	88.89%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.692	Shapiro Wilk Test Statistic	0.853
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	86.19	Mean	2.393
SD	259.9	SD	1.772
95% DL/2 (t) UCL	192.8	95% H-Stat (DL/2) UCL	94.37

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	0.689
		SD in Log Scale	3.017
		Mean in Original Scale	81.33
		SD in Original Scale	261.4
		95% Percentile Bootstrap UCL	200.3
		95% BCA Bootstrap UCL	306.7

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.353	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	820.6		
nu star	3.529		
A-D Test Statistic	0.566	**Nonparametric Statistics**	
5% A-D Critical Value	0.708	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.708	Mean	96.62
5% K-S Critical Value	0.371	SD	249.3
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	65.7
		95% KM (t) UCL	210.9
Assuming Gamma Distribution		95% KM (z) UCL	204.7
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	197.4
Minimum	0	95% KM (bootstrap t) UCL	3610
Maximum	7615	95% KM (BCA) UCL	306.7
Mean	1849	95% KM (Percentile Bootstrap) UCL	257.1
Median	1036	95% KM (Chebyshev) UCL	383
SD	2189	97.5% KM (Chebyshev) UCL	506.9
k star	0.194	99% KM (Chebyshev) UCL	750.3
Theta star	9546		
Nu star	6.974	**Potential UCLs to Use**	
AppChi2	2.156	95% KM (t) UCL	210.9
95% Gamma Approximate UCL	5981		
95% Adjusted Gamma UCL	6757		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(A)PYRENE (ug/kg)

General Statistics

Number of Valid Samples	18	Number of Detected Data	7
Number of Unique Samples	7	Number of Non-Detect Data	11
		Percent Non-Detects	61.11%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	3.4	Minimum Detected	1.224
Maximum Detected	58	Maximum Detected	4.06
Mean of Detected	19.51	Mean of Detected	2.646
SD of Detected	18.11	SD of Detected	0.885
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	14
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	77.78%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.778	Shapiro Wilk Test Statistic	0.971
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	8.531	Mean	1.093
SD	14.09	SD	1.488
95% DL/2 (t) UCL	14.31	95% H-Stat (DL/2) UCL	9.112
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	33.64	Mean in Log Scale	1.074
SD	16.95	SD in Log Scale	1.539
95% MLE (t) UCL	40.59	Mean in Original Scale	8.446
95% MLE (Tiku) UCL	47.87	SD in Original Scale	14.1
		95% Percentile Bootstrap UCL	14.14
		95% BCA Bootstrap UCL	17.24

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.057	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	18.46		
nu star	14.8		
A-D Test Statistic	0.304	**Nonparametric Statistics**	
5% A-D Critical Value	0.719	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.719	Mean	9.743
5% K-S Critical Value	0.316	SD	13.06
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	3.328
		95% KM (t) UCL	15.53
Assuming Gamma Distribution		95% KM (z) UCL	15.22
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	14.79
Minimum	0	95% KM (bootstrap t) UCL	19.94
Maximum	58	95% KM (BCA) UCL	21.67
Mean	24.94	95% KM (Percentile Bootstrap) UCL	19.11
Median	20.33	95% KM (Chebyshev) UCL	24.25
SD	17.64	97.5% KM (Chebyshev) UCL	30.53
k star	0.394	99% KM (Chebyshev) UCL	42.86
Theta star	63.33		
Nu star	14.18	**Potential UCLs to Use**	
AppChi2	6.692	95% KM (t) UCL	15.53
95% Gamma Approximate UCL	52.82		
95% Adjusted Gamma UCL	56.99		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(B)FLUORANTHENE (ug/kg)

General Statistics

Number of Valid Samples	18	Number of Detected Data	9
Number of Unique Samples	9	Number of Non-Detect Data	9
		Percent Non-Detects	50.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	5.2	Minimum Detected	1.649
Maximum Detected	110	Maximum Detected	4.7
Mean of Detected	26.88	Mean of Detected	2.843
SD of Detected	32.69	SD of Detected	0.946
Minimum Non-Detect	1.7	Minimum Non-Detect	0.531
Maximum Non-Detect	1.7	Maximum Non-Detect	0.531

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.662	Shapiro Wilk Test Statistic	0.954
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	13.86	Mean	1.34
SD	26.12	SD	1.677
95% DL/2 (t) UCL	24.57	95% H-Stat (DL/2) UCL	25.18
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.44
		SD in Log Scale	1.707
		Mean in Original Scale	14.15
		SD in Original Scale	25.98
		95% Percentile Bootstrap UCL	25.31
		95% BCA Bootstrap UCL	30.36

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.91	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	29.52		
nu star	16.39		
A-D Test Statistic	0.469	**Nonparametric Statistics**	
5% A-D Critical Value	0.739	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.739	Mean	16.04
5% K-S Critical Value	0.285	SD	24.34
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	6.084
		95% KM (t) UCL	26.62
Assuming Gamma Distribution		95% KM (z) UCL	26.05
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	26.04
Minimum	0	95% KM (bootstrap t) UCL	44.23
Maximum	110	95% KM (BCA) UCL	31.01
Mean	27.42	95% KM (Percentile Bootstrap) UCL	27.5
Median	17.5	95% KM (Chebyshev) UCL	42.56
SD	27.75	97.5% KM (Chebyshev) UCL	54.04
k star	0.243	99% KM (Chebyshev) UCL	76.58
Theta star	112.7		
Nu star	8.758	**Potential UCLs to Use**	
AppChi2	3.181	95% KM (t) UCL	26.62
95% Gamma Approximate UCL	75.48		
95% Adjusted Gamma UCL	83.78		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHRYSENE (ug/kg)

General Statistics

Number of Valid Samples	18	Number of Detected Data	10
Number of Unique Samples	10	Number of Non-Detect Data	8
		Percent Non-Detects	44.44%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	4.5	Minimum Detected	1.504
Maximum Detected	210	Maximum Detected	5.347
Mean of Detected	38.61	Mean of Detected	2.878
SD of Detected	62.33	SD of Detected	1.236
Minimum Non-Detect	2.4	Minimum Non-Detect	0.875
Maximum Non-Detect	2.4	Maximum Non-Detect	0.875

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.587	Shapiro Wilk Test Statistic	0.928
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	21.98	Mean	1.68
SD	49.22	SD	1.646
95% DL/2 (t) UCL	42.17	95% H-Stat (DL/2) UCL	53.07

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.335
		SD in Log Scale	2.107
		Mean in Original Scale	21.82
		SD in Original Scale	49.3
		95% Percentile Bootstrap UCL	41.95
		95% BCA Bootstrap UCL	55.61

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	0.605	**Data appear Gamma Distributed at 5% Significance Level**
Theta Star	63.8	
nu star	12.1	
A-D Test Statistic	0.621	**Nonparametric Statistics**
5% A-D Critical Value	0.756	Kaplan-Meier (KM) Method
K-S Test Statistic	0.756	Mean 23.45
5% K-S Critical Value	0.276	SD 47.22
Data appear Gamma Distributed at 5% Significance Level		SE of Mean 11.73
		95% KM (t) UCL 43.86
Assuming Gamma Distribution		95% KM (z) UCL 42.75
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL 43.34
Minimum	0	95% KM (bootstrap t) UCL 88.77
Maximum	210	95% KM (BCA) UCL 47.53
Mean	31.47	95% KM (Percentile Bootstrap) UCL 45.44
Median	14.5	95% KM (Chebyshev) UCL 74.59
SD	49.01	97.5% KM (Chebyshev) UCL 96.72
k star	0.18	99% KM (Chebyshev) UCL 140.2
Theta star	174.4	
Nu star	6.496	**Potential UCLs to Use**
AppChi2	1.898	95% KM (BCA) UCL 47.53
95% Gamma Approximate UCL	107.7	
95% Adjusted Gamma UCL	122.4	

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DIBENZO(A,H)ANTHRACENE (ug/kg)

General Statistics

Number of Valid Samples	18	Number of Detected Data	4
Number of Unique Samples	4	Number of Non-Detect Data	14
		Percent Non-Detects	77.78%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	16	Minimum Detected	2.773
Maximum Detected	36	Maximum Detected	3.584
Mean of Detected	26.25	Mean of Detected	3.207
SD of Detected	10.21	SD of Detected	0.409
Minimum Non-Detect	4.2	Minimum Non-Detect	1.435
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	14
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	77.78%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.845	Shapiro Wilk Test Statistic	0.855
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7.775	Mean	1.383
SD	11.06	SD	1.052
95% DL/2 (t) UCL	12.31	95% H-Stat (DL/2) UCL	7.771
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	27.25	Mean in Log Scale	1.798
SD	8.842	SD in Log Scale	0.991
95% MLE (t) UCL	30.88	Mean in Original Scale	9.64
95% MLE (Tiku) UCL	34.86	SD in Original Scale	10.43
		95% Percentile Bootstrap UCL	13.82
		95% BCA Bootstrap UCL	14.65

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	2.259	**Data appear Normal at 5% Significance Level**	
Theta Star	11.62		
nu star	18.07		
A-D Test Statistic	0.475	**Nonparametric Statistics**	
5% A-D Critical Value	0.658	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.658	Mean	18.28
5% K-S Critical Value	0.395	SD	5.961
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.622
		95% KM (t) UCL	21.1
Assuming Gamma Distribution		95% KM (z) UCL	20.95
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	20.91
Minimum	14.26	95% KM (bootstrap t) UCL	20.13
Maximum	69.95	95% KM (BCA) UCL	N/A
Mean	42.3	95% KM (Percentile Bootstrap) UCL	34.22
Median	44.28	95% KM (Chebyshev) UCL	25.35
SD	17.26	97.5% KM (Chebyshev) UCL	28.41
k star	4.411	99% KM (Chebyshev) UCL	34.42
Theta star	9.591		
Nu star	158.8	**Potential UCLs to Use**	
AppChi2	130.7	95% KM (t) UCL	21.1
95% Gamma Approximate UCL	51.41	95% KM (Percentile Bootstrap) UCL	34.22
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

INDENO(1,2,3-CD)PYRENE (ug/kg)

General Statistics

Number of Valid Samples	18	Number of Detected Data	5
Number of Unique Samples	4	Number of Non-Detect Data	13
		Percent Non-Detects	72.22%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	14	Minimum Detected	2.639
Maximum Detected	390	Maximum Detected	5.966
Mean of Detected	113.2	Mean of Detected	3.916
SD of Detected	159.7	SD of Detected	1.428
Minimum Non-Detect	2.5	Minimum Non-Detect	0.916
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	13
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	5
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	72.22%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.731	Shapiro Wilk Test Statistic	0.899
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	32.75	Mean	1.4
SD	92.92	SD	1.801
95% DL/2 (t) UCL	70.85	95% H-Stat (DL/2) UCL	35.03

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.346
		SD in Log Scale	3.332
		Mean in Original Scale	31.86
		SD in Original Scale	93.24
		95% Percentile Bootstrap UCL	72.27
		95% BCA Bootstrap UCL	98.31

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.429	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	264.1		
nu star	4.286		
A-D Test Statistic	0.422	**Nonparametric Statistics**	
5% A-D Critical Value	0.699	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.699	Mean	41.56
5% K-S Critical Value	0.367	SD	87.4
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	23.03
		95% KM (t) UCL	81.62
Assuming Gamma Distribution		95% KM (z) UCL	79.44
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	78.43
Minimum	0	95% KM (bootstrap t) UCL	320.8
Maximum	2345	95% KM (BCA) UCL	110
Mean	573.8	95% KM (Percentile Bootstrap) UCL	98.89
Median	363.8	95% KM (Chebyshev) UCL	142
SD	693.7	97.5% KM (Chebyshev) UCL	185.4
k star	0.275	99% KM (Chebyshev) UCL	270.7
Theta star	2087		
Nu star	9.897	**Potential UCLs to Use**	
AppChi2	3.877	95% KM (t) UCL	81.62
95% Gamma Approximate UCL	1465		
95% Adjusted Gamma UCL	1612		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NAPHTHALENE (ug/kg)

General Statistics			
Number of Valid Samples	18	Number of Detected Data	9
Number of Unique Samples	8	Number of Non-Detect Data	9
		Percent Non-Detects	50.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	46	Minimum Detected	3.829
Maximum Detected	9400	Maximum Detected	9.148
Mean of Detected	1996	Mean of Detected	6.081
SD of Detected	3504	SD of Detected	1.821
Minimum Non-Detect	14	Minimum Non-Detect	2.639
Maximum Non-Detect	51	Maximum Non-Detect	3.932

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	10
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	8
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	55.56%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.616	Shapiro Wilk Test Statistic	0.884
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1004	Mean	4.154
SD	2612	SD	2.375
95% DL/2 (t) UCL	2074	95% H-Stat (DL/2) UCL	12046

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	3.531
		SD in Log Scale	3.072
		Mean in Original Scale	1001
		SD in Original Scale	2613
		95% Percentile Bootstrap UCL	2055
		95% BCA Bootstrap UCL	2483

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.36	**Data appear Lognormal at 5% Significance Level**	
Theta Star	5547		
nu star	6.478		

A-D Test Statistic	0.98	**Nonparametric Statistics**	
5% A-D Critical Value	0.784	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.784	Mean	1021
5% K-S Critical Value	0.297	SD	2531
Data not Gamma Distributed at 5% Significance Level		SE of Mean	632.8
		95% KM (t) UCL	2122
Assuming Gamma Distribution		95% KM (z) UCL	2062
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2056
Minimum	46	95% KM (bootstrap t) UCL	15745
Maximum	9400	95% KM (BCA) UCL	2240
Mean	1783	95% KM (Percentile Bootstrap) UCL	2110
Median	855.2	95% KM (Chebyshev) UCL	3779
SD	2483	97.5% KM (Chebyshev) UCL	4973
k star	0.644	99% KM (Chebyshev) UCL	7318
Theta star	2771		
Nu star	23.17	**Potential UCLs to Use**	
AppChi2	13.22	99% KM (Chebyshev) UCL	7318
95% Gamma Approximate UCL	3126		
95% Adjusted Gamma UCL	3305		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PHENANTHRENE (ug/kg)

General Statistics

Number of Valid Samples	18	Number of Detected Data	5
Number of Unique Samples	5	Number of Non-Detect Data	13
		Percent Non-Detects	72.22%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	19	Minimum Detected	2.944
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	42.6	Mean of Detected	3.468
SD of Detected	43.36	SD of Detected	0.748
Minimum Non-Detect	8.5	Minimum Non-Detect	2.14
Maximum Non-Detect	51	Maximum Non-Detect	3.932

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	17
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	94.44%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.616	Shapiro Wilk Test Statistic	0.713
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	17.18	Mean	2.204
SD	27.34	SD	1.045
95% DL/2 (t) UCL	28.39	95% H-Stat (DL/2) UCL	18.04

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	1.862
		SD in Log Scale	1.289
		Mean in Original Scale	15.07
		SD in Original Scale	27.51
		95% Percentile Bootstrap UCL	27
		95% BCA Bootstrap UCL	34.18

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.899	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	47.41		
nu star	8.985		

A-D Test Statistic	0.97	**Nonparametric Statistics**	
5% A-D Critical Value	0.685	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.685	Mean	25.68
5% K-S Critical Value	0.361	SD	22.99
Data not Gamma Distributed at 5% Significance Level		SE of Mean	6.063
		95% KM (t) UCL	36.23
Assuming Gamma Distribution		95% KM (z) UCL	35.65
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	34.05
Minimum	1.66	95% KM (bootstrap t) UCL	91.02
Maximum	228.1	95% KM (BCA) UCL	42.5
Mean	97.18	95% KM (Percentile Bootstrap) UCL	39.17
Median	96.72	95% KM (Chebyshev) UCL	52.11
SD	72.41	97.5% KM (Chebyshev) UCL	63.55
k star	1.037	99% KM (Chebyshev) UCL	86.01
Theta star	93.69		
Nu star	37.34	**Potential UCLs to Use**	
AppChi2	24.35	95% KM (t) UCL	36.23
95% Gamma Approximate UCL	149	95% KM (% Bootstrap) UCL	39.17
95% Adjusted Gamma UCL	155.4		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PYRENE (ug/kg)

General Statistics			
Number of Valid Samples	18	Number of Detected Data	13
Number of Unique Samples	12	Number of Non-Detect Data	5
		Percent Non-Detects	27.78%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	13	Minimum Detected	2.565
Maximum Detected	180	Maximum Detected	5.193
Mean of Detected	46.23	Mean of Detected	3.479
SD of Detected	46.95	SD of Detected	0.831
Minimum Non-Detect	4.3	Minimum Non-Detect	1.459
Maximum Non-Detect	20	Maximum Non-Detect	2.996
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	10
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	8
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	55.56%
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.725	Shapiro Wilk Test Statistic	0.917
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	34.42	Mean	2.811
SD	44.07	SD	1.353
95% DL/2 (t) UCL	52.49	95% H-Stat (DL/2) UCL	80.15
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	5.757	Mean in Log Scale	2.97
SD	71.11	SD in Log Scale	1.123
95% MLE (t) UCL	34.92	Mean in Original Scale	34.97
95% MLE (Tiku) UCL	44.48	SD in Original Scale	43.66
		95% Percentile Bootstrap UCL	52.76
		95% BCA Bootstrap UCL	57.98
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.249	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	37		
nu star	32.48		
A-D Test Statistic	0.625	**Nonparametric Statistics**	
5% A-D Critical Value	0.75	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.75	Mean	37.06
5% K-S Critical Value	0.241	SD	41.09
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	10.08
		95% KM (t) UCL	54.6
Assuming Gamma Distribution		95% KM (z) UCL	53.64
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	54.4
Minimum	0	95% KM (bootstrap t) UCL	70.65
Maximum	180	95% KM (BCA) UCL	54.72
Mean	37.04	95% KM (Percentile Bootstrap) UCL	55.44
Median	21.94	95% KM (Chebyshev) UCL	81
SD	42.83	97.5% KM (Chebyshev) UCL	100
k star	0.354	99% KM (Chebyshev) UCL	137.4
Theta star	104.6		
Nu star	12.75	**Potential UCLs to Use**	
AppChi2	5.723	95% KM (Percentile Bootstrap) UCL	55.44
95% Gamma Approximate UCL	82.5		
95% Adjusted Gamma UCL	89.48		

Note: DL/2 is not a recommended method.

Table C.10-2
EPC Calculation Results - Area A Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,4,6-TRINITROTOLUENE (mg/kg)

General Statistics

Number of Valid Samples	29	Number of Detected Data	4
Number of Unique Samples	4	Number of Non-Detect Data	25
		Percent Non-Detects	86.21%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.43	Minimum Detected	-0.844
Maximum Detected	130	Maximum Detected	4.868
Mean of Detected	33.73	Mean of Detected	1.373
SD of Detected	64.19	SD of Detected	2.467
Minimum Non-Detect	0.051	Minimum Non-Detect	-2.976
Maximum Non-Detect	0.16	Maximum Non-Detect	-1.833

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	25
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	86.21%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.646	Shapiro Wilk Test Statistic	0.902
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	4.709	Mean	-2.251
SD	24.1	SD	1.744
95% DL/2 (t) UCL	12.32	95% H-Stat (DL/2) UCL	0.742

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-10.8
		SD in Log Scale	7.062
		Mean in Original Scale	4.654
		SD in Original Scale	24.12
		95% Percentile Bootstrap UCL	13.56
		95% BCA Bootstrap UCL	22.57

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.246	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	137		
nu star	1.97		
A-D Test Statistic	0.561	**Nonparametric Statistics**	
5% A-D Critical Value	0.702	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.702	Mean	5.023
5% K-S Critical Value	0.417	SD	23.62
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	5.065
		95% KM (t) UCL	13.64
Assuming Gamma Distribution		95% KM (z) UCL	13.36
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	11.97
Minimum	0	95% KM (bootstrap t) UCL	276.5
Maximum	255.3	95% KM (BCA) UCL	N/A
Mean	44.5	95% KM (Percentile Bootstrap) UCL	18.43
Median	3.451	95% KM (Chebyshev) UCL	27.1
SD	68.85	97.5% KM (Chebyshev) UCL	36.66
k star	0.1	99% KM (Chebyshev) UCL	55.42
Theta star	444.3		
Nu star	5.808	**Potential UCLs to Use**	
AppChi2	1.543	95% KM (t) UCL	13.64
95% Gamma Approximate UCL	167.5		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-3
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Full Data Sets

User Selected Options

From File	WorkSheet_a.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ALUMINUM (mg/kg)

General Statistics

Number of Valid Samples	51	Number of Unique Samples	45

Raw Statistics		**Log-transformed Statistics**	
Minimum	5550	Minimum of Log Data	8.622
Maximum	19400	Maximum of Log Data	9.873
Mean	11480	Mean of log Data	9.31
Median	11000	SD of log Data	0.28
SD	3180		
Coefficient of Variation	0.277		
Skewness	0.482		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.118	Lilliefors Test Statistic	0.0735
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12227	95% H-UCL	12324
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13486
95% Adjusted-CLT UCL	12245	97.5% Chebyshev (MVUE) UCL	14351
95% Modified-t UCL	12232	99% Chebyshev (MVUE) UCL	16050

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	12.58	**Data appear Normal at 5% Significance Level**	
Theta Star	912.3		
nu star	1284		
Approximate Chi Square Value (.05)	1201	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	12213
Adjusted Chi Square Value	1199	95% Jackknife UCL	12227
		95% Standard Bootstrap UCL	12212
Anderson-Darling Test Statistic	0.233	95% Bootstrap-t UCL	12252
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	12233
Kolmogorov-Smirnov Test Statistic	0.0816	95% Percentile Bootstrap UCL	12244
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	12283
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13421
		97.5% Chebyshev(Mean, Sd) UCL	14261
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15911
95% Approximate Gamma UCL	12266		
95% Adjusted Gamma UCL	12289		

Potential UCL to Use		
	Use 95% Student's-t UCL	12227

Table C.10-3
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM (mg/kg)

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	42
Raw Statistics		**Log-transformed Statistics**	
Minimum	9.7	Minimum of Log Data	2.272
Maximum	29.5	Maximum of Log Data	3.384
Mean	18.72	Mean of log Data	2.905
Median	18.1	SD of log Data	0.225
SD	4.085		
Coefficient of Variation	0.218		
Skewness	0.235		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.07	Lilliefors Test Statistic	0.0804
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	19.68	95% H-UCL	19.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21.33
95% Adjusted-CLT UCL	19.68	97.5% Chebyshev (MVUE) UCL	22.46
95% Modified-t UCL	19.68	99% Chebyshev (MVUE) UCL	24.67
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	19.64	**Data appear Normal at 5% Significance Level**	
Theta Star	0.953		
nu star	2003		
Approximate Chi Square Value (.05)	1900	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	19.66
Adjusted Chi Square Value	1897	95% Jackknife UCL	19.68
		95% Standard Bootstrap UCL	19.64
Anderson-Darling Test Statistic	0.171	95% Bootstrap-t UCL	19.73
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	19.73
Kolmogorov-Smirnov Test Statistic	0.0673	95% Percentile Bootstrap UCL	19.66
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	19.74
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21.21
		97.5% Chebyshev(Mean, Sd) UCL	22.29
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.41
95% Approximate Gamma UCL	19.73		
95% Adjusted Gamma UCL	19.76		
Potential UCL to Use		Use 95% Student's-t UCL	19.68

Table C.10-3
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT (mg/kg)

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	38
Raw Statistics		**Log-transformed Statistics**	
Minimum	4.7	Minimum of Log Data	1.548
Maximum	16	Maximum of Log Data	2.773
Mean	8.332	Mean of log Data	2.095
Median	8.2	SD of log Data	0.224
SD	1.944		
Coefficient of Variation	0.233		
Skewness	1.174		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.0911	Lilliefors Test Statistic	0.0657
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.789	95% H-UCL	8.801
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.478
95% Adjusted-CLT UCL	8.828	97.5% Chebyshev (MVUE) UCL	9.975
95% Modified-t UCL	8.796	99% Chebyshev (MVUE) UCL	10.95
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	19.04	**Data appear Normal at 5% Significance Level**	
Theta Star	0.438		
nu star	1942		
Approximate Chi Square Value (.05)	1841	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	8.78
Adjusted Chi Square Value	1838	95% Jackknife UCL	8.789
		95% Standard Bootstrap UCL	8.772
Anderson-Darling Test Statistic	0.281	95% Bootstrap-t UCL	8.856
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	8.892
Kolmogorov-Smirnov Test Statistic	0.061	95% Percentile Bootstrap UCL	8.793
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	8.831
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.519
		97.5% Chebyshev(Mean, Sd) UCL	10.03
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.04
95% Approximate Gamma UCL	8.791		
95% Adjusted Gamma UCL	8.805		
Potential UCL to Use		Use 95% Student's-t UCL	8.789

Table C.10-3
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON (mg/kg)

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	42
Raw Statistics		**Log-transformed Statistics**	
Minimum	10100	Minimum of Log Data	9.22
Maximum	27200	Maximum of Log Data	10.21
Mean	18610	Mean of log Data	9.811
Median	18000	SD of log Data	0.208
SD	3808		
Coefficient of Variation	0.205		
Skewness	0.259		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.0755	Lilliefors Test Statistic	0.0599
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	19503	95% H-UCL	19593
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21004
95% Adjusted-CLT UCL	19508	97.5% Chebyshev (MVUE) UCL	22037
95% Modified-t UCL	19507	99% Chebyshev (MVUE) UCL	24066
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	22.69	**Data appear Normal at 5% Significance Level**	
Theta Star	820.1		
nu star	2314		
Approximate Chi Square Value (.05)	2204	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	19487
Adjusted Chi Square Value	2201	95% Jackknife UCL	19503
		95% Standard Bootstrap UCL	19471
Anderson-Darling Test Statistic	0.21	95% Bootstrap-t UCL	19526
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	19456
Kolmogorov-Smirnov Test Statistic	0.064	95% Percentile Bootstrap UCL	19486
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	19527
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20934
		97.5% Chebyshev(Mean, Sd) UCL	21940
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23915
95% Approximate Gamma UCL	19545		
95% Adjusted Gamma UCL	19573		
Potential UCL to Use		Use 95% Student's-t UCL	19503

Table C.10-3
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD (mg/kg)

General Statistics			
Number of Valid Samples	53	Number of Unique Samples	48
Raw Statistics		**Log-transformed Statistics**	
Minimum	4.4	Minimum of Log Data	1.482
Maximum	528	Maximum of Log Data	6.269
Mean	45.85	Mean of log Data	2.912
Median	10.9	SD of log Data	1.168
SD	94.06		
Coefficient of Variation	2.052		
Skewness	3.907		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.33	Lilliefors Test Statistic	0.182
Lilliefors Critical Value	0.122	Lilliefors Critical Value	0.122
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	67.49	95% H-UCL	54.38
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	66.31
95% Adjusted-CLT UCL	74.51	97.5% Chebyshev (MVUE) UCL	79.58
95% Modified-t UCL	68.64	99% Chebyshev (MVUE) UCL	105.6
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.641	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	71.53		
nu star	67.94		
Approximate Chi Square Value (.05)	49.97	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0455	95% CLT UCL	67.1
Adjusted Chi Square Value	49.54	95% Jackknife UCL	67.49
		95% Standard Bootstrap UCL	67.16
Anderson-Darling Test Statistic	4.981	95% Bootstrap-t UCL	93.44
Anderson-Darling 5% Critical Value	0.8	95% Hall's Bootstrap UCL	156.6
Kolmogorov-Smirnov Test Statistic	0.246	95% Percentile Bootstrap UCL	69.32
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	76.08
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	102.2
		97.5% Chebyshev(Mean, Sd) UCL	126.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	174.4
95% Approximate Gamma UCL	62.34		
95% Adjusted Gamma UCL	62.88		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	126.5

Table C.10-3
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE (mg/kg)

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	48
Raw Statistics		**Log-transformed Statistics**	
Minimum	220	Minimum of Log Data	5.394
Maximum	909	Maximum of Log Data	6.812
Mean	520.6	Mean of log Data	6.221
Median	519	SD of log Data	0.269
SD	135.4		
Coefficient of Variation	0.26		
Skewness	0.548		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.107	Lilliefors Test Statistic	0.0946
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	552.4	95% H-UCL	557.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	608.3
95% Adjusted-CLT UCL	553.3	97.5% Chebyshev (MVUE) UCL	646
95% Modified-t UCL	552.6	99% Chebyshev (MVUE) UCL	720
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	13.94	**Data appear Normal at 5% Significance Level**	
Theta Star	37.34		
nu star	1422		
Approximate Chi Square Value (.05)	1336	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	551.8
Adjusted Chi Square Value	1333	95% Jackknife UCL	552.4
		95% Standard Bootstrap UCL	550.9
Anderson-Darling Test Statistic	0.409	95% Bootstrap-t UCL	554.1
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	554.5
Kolmogorov-Smirnov Test Statistic	0.0876	95% Percentile Bootstrap UCL	551.4
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	552.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	603.2
		97.5% Chebyshev(Mean, Sd) UCL	639
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	709.2
95% Approximate Gamma UCL	554.3		
95% Adjusted Gamma UCL	555.3		
Potential UCL to Use		Use 95% Student's-t UCL	552.4

Table C.10-3
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

VANADIUM (mg/kg)

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	47
Raw Statistics		**Log-transformed Statistics**	
Minimum	14.6	Minimum of Log Data	2.681
Maximum	55.3	Maximum of Log Data	4.013
Mean	27.51	Mean of log Data	3.269
Median	25.4	SD of log Data	0.297
SD	9.018		
Coefficient of Variation	0.328		
Skewness	1.391		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.169	Lilliefors Test Statistic	0.112
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	29.63	95% H-UCL	29.57
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	32.51
95% Adjusted-CLT UCL	29.85	97.5% Chebyshev (MVUE) UCL	34.7
95% Modified-t UCL	29.67	99% Chebyshev (MVUE) UCL	39
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	10.48	**Data appear Lognormal at 5% Significance Level**	
Theta Star	2.624		
nu star	1069		
Approximate Chi Square Value (.05)	994.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	29.59
Adjusted Chi Square Value	992.4	95% Jackknife UCL	29.63
		95% Standard Bootstrap UCL	29.6
Anderson-Darling Test Statistic	1.015	95% Bootstrap-t UCL	29.94
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	29.94
Kolmogorov-Smirnov Test Statistic	0.132	95% Percentile Bootstrap UCL	29.71
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	29.95
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	33.01
		97.5% Chebyshev(Mean, Sd) UCL	35.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	40.07
95% Approximate Gamma UCL	29.58		
95% Adjusted Gamma UCL	29.64		
Potential UCL to Use		Use 95% Student's-t UCL	29.63
		or 95% Modified-t UCL	29.67
		or 95% H-UCL	29.57

Table C.10-3
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,3,7,8-TCDD TEQ (pg/g)

General Statistics			
Number of Valid Samples	23	Number of Unique Samples	23
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0286	Minimum of Log Data	-3.554
Maximum	16.99	Maximum of Log Data	2.833
Mean	1.635	Mean of log Data	-1.3
Median	0.106	SD of log Data	1.839
SD	3.763		
Coefficient of Variation	2.301		
Skewness	3.47		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.485	Shapiro Wilk Test Statistic	0.876
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.983	95% H-UCL	6.591
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.89
95% Adjusted-CLT UCL	3.532	97.5% Chebyshev (MVUE) UCL	5.032
95% Modified-t UCL	3.077	99% Chebyshev (MVUE) UCL	7.275
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.352	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	4.643		
nu star	16.2		
Approximate Chi Square Value (.05)	8.105	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0389	95% CLT UCL	2.926
Adjusted Chi Square Value	7.691	95% Jackknife UCL	2.983
		95% Standard Bootstrap UCL	2.861
Anderson-Darling Test Statistic	2.221	95% Bootstrap-t UCL	4.982
Anderson-Darling 5% Critical Value	0.833	95% Hall's Bootstrap UCL	6.964
Kolmogorov-Smirnov Test Statistic	0.259	95% Percentile Bootstrap UCL	2.967
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	3.837
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.056
		97.5% Chebyshev(Mean, Sd) UCL	6.535
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.443
95% Approximate Gamma UCL	3.269		
95% Adjusted Gamma UCL	3.445		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	9.443

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet_a.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ANTIMONY (mg/kg)

General Statistics

Number of Valid Samples	44	Number of Detected Data	26
Number of Unique Samples	22	Number of Non-Detect Data	18
		Percent Non-Detects	40.91%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.04	Minimum Detected	-3.219
Maximum Detected	4.8	Maximum Detected	1.569
Mean of Detected	0.535	Mean of Detected	-1.181
SD of Detected	0.892	SD of Detected	1.059
Minimum Non-Detect	0.4	Minimum Non-Detect	-0.916
Maximum Non-Detect	0.46	Maximum Non-Detect	-0.777

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	32
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	12
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	72.73%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.39	Shapiro Wilk Test Statistic	0.834
5% Shapiro Wilk Critical Value	0.92	5% Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.404	Mean	-1.327
SD	0.698	SD	0.827
95% DL/2 (t) UCL	0.581	95% H-Stat (DL/2) UCL	0.436
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-1.546
		SD in Log Scale	0.967
		Mean in Original Scale	0.373
		SD in Original Scale	0.709
		95% Percentile Bootstrap UCL	0.585
		95% BCA Bootstrap UCL	0.691

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.941	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.569		
nu star	48.92		
A-D Test Statistic	2.116	**Nonparametric Statistics**	
5% A-D Critical Value	0.773	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.773	Mean	0.392
5% K-S Critical Value	0.176	SD	0.699
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.11
		95% KM (t) UCL	0.576
Assuming Gamma Distribution		95% KM (z) UCL	0.572
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.575
Minimum	0.04	95% KM (bootstrap t) UCL	0.826
Maximum	4.8	95% KM (BCA) UCL	0.628
Mean	0.536	95% KM (Percentile Bootstrap) UCL	0.591
Median	0.48	95% KM (Chebyshev) UCL	0.87
SD	0.681	97.5% KM (Chebyshev) UCL	1.077
k star	1.561	99% KM (Chebyshev) UCL	1.483
Theta star	0.343		
Nu star	137.4	**Potential UCLs to Use**	
AppChi2	111.3	95% KM (Chebyshev) UCL	0.87
95% Gamma Approximate UCL	0.661		
95% Adjusted Gamma UCL	0.666		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC (mg/kg)

General Statistics

Number of Valid Samples	51	Number of Detected Data	50
Number of Unique Samples	27	Number of Non-Detect Data	1
		Percent Non-Detects	1.96%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.33	Minimum Detected	-1.109
Maximum Detected	2.5	Maximum Detected	0.916
Mean of Detected	1.228	Mean of Detected	0.136
SD of Detected	0.45	SD of Detected	0.387
Minimum Non-Detect	0.26	Minimum Non-Detect	-1.347
Maximum Non-Detect	0.26	Maximum Non-Detect	-1.347

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.963	Lilliefors Test Statistic	0.974
5% Lilliefors Critical Value	0.947	5% Lilliefors Critical Value	0.947
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.206	Mean	0.0937
SD	0.472	SD	0.489
95% DL/2 (t) UCL	1.317	95% H-Stat (DL/2) UCL	1.356
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.206	Mean in Log Scale	0.117
SD	0.469	SD in Log Scale	0.407
95% MLE (t) UCL	1.316	Mean in Original Scale	1.212
95% MLE (Tiku) UCL	1.316	SD in Original Scale	0.46
		95% Percentile Bootstrap UCL	1.317
		95% BCA Bootstrap UCL	1.319

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	6.979	**Data appear Normal at 5% Significance Level**	
Theta Star	0.176		
nu star	697.9		
A-D Test Statistic	0.305	**Nonparametric Statistics**	
5% A-D Critical Value	0.752	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.752	Mean	1.21
5% K-S Critical Value	0.125	SD	0.459
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0649
		95% KM (t) UCL	1.319
Assuming Gamma Distribution		95% KM (z) UCL	1.317
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.317
Minimum	0	95% KM (bootstrap t) UCL	1.332
Maximum	2.5	95% KM (BCA) UCL	1.323
Mean	1.204	95% KM (Percentile Bootstrap) UCL	1.317
Median	1.2	95% KM (Chebyshev) UCL	1.493
SD	0.478	97.5% KM (Chebyshev) UCL	1.615
k star	1.172	99% KM (Chebyshev) UCL	1.856
Theta star	1.027		
Nu star	119.5	**Potential UCLs to Use**	
AppChi2	95.28	95% KM (t) UCL	1.319
95% Gamma Approximate UCL	1.51	95% KM (Percentile Bootstrap) UCL	1.317
95% Adjusted Gamma UCL	1.52		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

HEPTACHLOR EPOXIDE (ug/kg)

General Statistics

Number of Valid Samples	31	Number of Detected Data	5
Number of Unique Samples	5	Number of Non-Detect Data	26
		Percent Non-Detects	83.87%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.9	Minimum Detected	0.642
Maximum Detected	290	Maximum Detected	5.67
Mean of Detected	131.9	Mean of Detected	3.707
SD of Detected	134	SD of Detected	2.26
Minimum Non-Detect	0.26	Minimum Non-Detect	-1.347
Maximum Non-Detect	4.15	Maximum Non-Detect	1.423

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	27
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	87.10%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.87	Shapiro Wilk Test Statistic	0.859
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	21.78	Mean	-0.232
SD	69.3	SD	2.109
95% DL/2 (t) UCL	42.9	95% H-Stat (DL/2) UCL	14.03

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.619
		SD in Log Scale	4.404
		Mean in Original Scale	21.28
		SD in Original Scale	69.46
		95% Percentile Bootstrap UCL	43.04
		95% BCA Bootstrap UCL	50.57

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.347	**Data appear Normal at 5% Significance Level**	
Theta Star	379.6		
nu star	3.474		
A-D Test Statistic	0.425	**Nonparametric Statistics**	
5% A-D Critical Value	0.709	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.709	Mean	22.86
5% K-S Critical Value	0.371	SD	67.84
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	13.62
		95% KM (t) UCL	45.98
Assuming Gamma Distribution		95% KM (z) UCL	45.27
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	41.09
Minimum	1.9	95% KM (bootstrap t) UCL	45.9
Maximum	290	95% KM (BCA) UCL	253.9
Mean	131.3	95% KM (Percentile Bootstrap) UCL	130.6
Median	121.7	95% KM (Chebyshev) UCL	82.24
SD	66.65	97.5% KM (Chebyshev) UCL	107.9
k star	2.021	99% KM (Chebyshev) UCL	158.4
Theta star	64.97		
Nu star	125.3	**Potential UCLs to Use**	
AppChi2	100.5	95% KM (t) UCL	45.98
95% Gamma Approximate UCL	163.8	95% KM (Percentile Bootstrap) UCL	130.6
95% Adjusted Gamma UCL	165.9		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR 1254 (ug/kg)

General Statistics

Number of Valid Samples	31	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	28
		Percent Non-Detects	90.32%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	28	Minimum Detected	3.332
Maximum Detected	200	Maximum Detected	5.298
Mean of Detected	97.67	Mean of Detected	4.268
SD of Detected	90.53	SD of Detected	0.986
Minimum Non-Detect	6.8	Minimum Non-Detect	1.917
Maximum Non-Detect	9	Maximum Non-Detect	2.197

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	28
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	90.32%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Test Statistic	0.993
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	12.95	Mean	1.63
SD	36.62	SD	0.919
95% DL/2 (t) UCL	24.11	95% H-Stat (DL/2) UCL	8.754
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	123.8	Mean in Log Scale	-2.007
SD	73.92	SD in Log Scale	2.776
95% MLE (t) UCL	146.4	Mean in Original Scale	9.701
95% MLE (Tiku) UCL	194.4	SD in Original Scale	37.46
		95% Percentile Bootstrap UCL	22.47
		95% BCA Bootstrap UCL	32.48

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.283	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	34.74
5% K-S Critical Value	N/A	SD	30.87
Data not Gamma Distributed at 5% Significance Level		SE of Mean	6.791
		95% KM (t) UCL	46.27
Assuming Gamma Distribution		95% KM (z) UCL	45.91
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	59.22
Minimum	N/A	95% KM (bootstrap t) UCL	50.94
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	200
Median	N/A	95% KM (Chebyshev) UCL	64.34
SD	N/A	97.5% KM (Chebyshev) UCL	77.15
k star	N/A	99% KM (Chebyshev) UCL	102.3
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	46.27
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	200
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DI-N-OCTYLPHTHALATE (ug/kg)

General Statistics

Number of Valid Samples	36	Number of Detected Data	12
Number of Unique Samples	12	Number of Non-Detect Data	24
		Percent Non-Detects	66.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	31	Minimum Detected	3.434
Maximum Detected	385	Maximum Detected	5.953
Mean of Detected	165	Mean of Detected	4.787
SD of Detected	121.2	SD of Detected	0.9
Minimum Non-Detect	380	Minimum Non-Detect	5.94
Maximum Non-Detect	420	Maximum Non-Detect	6.04

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	36
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.915	Shapiro Wilk Test Statistic	0.917
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	188.5	Mean	5.128
SD	70.21	SD	0.561
95% DL/2 (t) UCL	208.2	95% H-Stat (DL/2) UCL	237.8

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	4.749
		SD in Log Scale	0.729
		Mean in Original Scale	146.9
		SD in Original Scale	100.2
		95% Percentile Bootstrap UCL	175
		95% BCA Bootstrap UCL	176.1

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.342	**Data appear Normal at 5% Significance Level**	
Theta Star	122.9		
nu star	32.22		
A-D Test Statistic	0.336	**Nonparametric Statistics**	
5% A-D Critical Value	0.744	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.744	Mean	161
5% K-S Critical Value	0.249	SD	113.2
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	33.4
		95% KM (t) UCL	217.4
Assuming Gamma Distribution		95% KM (z) UCL	215.9
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	219
Minimum	31	95% KM (bootstrap t) UCL	226.9
Maximum	385	95% KM (BCA) UCL	215.2
Mean	174.8	95% KM (Percentile Bootstrap) UCL	216.7
Median	180.1	95% KM (Chebyshev) UCL	306.6
SD	88.16	97.5% KM (Chebyshev) UCL	369.6
k star	2.952	99% KM (Chebyshev) UCL	493.3
Theta star	59.21		
Nu star	212.5	**Potential UCLs to Use**	
AppChi2	179.8	95% KM (t) UCL	217.4
95% Gamma Approximate UCL	206.6	95% KM (Percentile Bootstrap) UCL	216.7
95% Adjusted Gamma UCL	208.2		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(A)ANTHRACENE (ug/kg)

General Statistics

Number of Valid Samples	36	Number of Detected Data	17
Number of Unique Samples	15	Number of Non-Detect Data	19
		Percent Non-Detects	52.78%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	3.6	Minimum Detected	1.281
Maximum Detected	350	Maximum Detected	5.858
Mean of Detected	40.46	Mean of Detected	2.787
SD of Detected	82.43	SD of Detected	1.243
Minimum Non-Detect	2.2	Minimum Non-Detect	0.788
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	26
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	10
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	72.22%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.46	Shapiro Wilk Test Statistic	0.93
5% Shapiro Wilk Critical Value	0.892	5% Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	20.01	Mean	1.493
SD	59.1	SD	1.554
95% DL/2 (t) UCL	36.65	95% H-Stat (DL/2) UCL	11.79

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.017
		SD in Log Scale	2.077
		Mean in Original Scale	19.61
		SD in Original Scale	59.22
		95% Percentile Bootstrap UCL	38.14
		95% BCA Bootstrap UCL	53.13

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.588	**Data appear Lognormal at 5% Significance Level**	
Theta Star	68.8		
nu star	19.99		
A-D Test Statistic	1.151	**Nonparametric Statistics**	
5% A-D Critical Value	0.784	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.784	Mean	21.06
5% K-S Critical Value	0.218	SD	57.94
Data not Gamma Distributed at 5% Significance Level		SE of Mean	9.954
		95% KM (t) UCL	37.88
Assuming Gamma Distribution		95% KM (z) UCL	37.44
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	37.61
Minimum	0	95% KM (bootstrap t) UCL	83.88
Maximum	350	95% KM (BCA) UCL	40.85
Mean	43.25	95% KM (Percentile Bootstrap) UCL	39.17
Median	16	95% KM (Chebyshev) UCL	64.45
SD	67.05	97.5% KM (Chebyshev) UCL	83.23
k star	0.156	99% KM (Chebyshev) UCL	120.1
Theta star	278.1		
Nu star	11.2	**Potential UCLs to Use**	
AppChi2	4.703	95% KM (BCA) UCL	40.85
95% Gamma Approximate UCL	103		
95% Adjusted Gamma UCL	107.3		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(A)PYRENE (ug/kg)

General Statistics

Number of Valid Samples	36	Number of Detected Data	13
Number of Unique Samples	13	Number of Non-Detect Data	23
		Percent Non-Detects	63.89%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2	Minimum Detected	0.693
Maximum Detected	675	Maximum Detected	6.515
Mean of Detected	68.48	Mean of Detected	2.744
SD of Detected	183	SD of Detected	1.528
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	29
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	80.56%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.384	Shapiro Wilk Test Statistic	0.922
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	25.82	Mean	1.102
SD	112	SD	1.655
95% DL/2 (t) UCL	57.35	95% H-Stat (DL/2) UCL	11.69

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.0835
		SD in Log Scale	2.681
		Mean in Original Scale	25.03
		SD in Original Scale	112.1
		95% Percentile Bootstrap UCL	61.86
		95% BCA Bootstrap UCL	82.5

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.388	**Data appear Lognormal at 5% Significance Level**	
Theta Star	176.5		
nu star	10.09		
A-D Test Statistic	1.501	**Nonparametric Statistics**	
5% A-D Critical Value	0.802	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.802	Mean	26.12
5% K-S Critical Value	0.252	SD	110.3
Data not Gamma Distributed at 5% Significance Level		SE of Mean	19.14
		95% KM (t) UCL	58.46
Assuming Gamma Distribution		95% KM (z) UCL	57.61
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	57.3
Minimum	0	95% KM (bootstrap t) UCL	312.3
Maximum	1126	95% KM (BCA) UCL	65.48
Mean	195.3	95% KM (Percentile Bootstrap) UCL	62.92
Median	33.31	95% KM (Chebyshev) UCL	109.6
SD	286.1	97.5% KM (Chebyshev) UCL	145.7
k star	0.141	99% KM (Chebyshev) UCL	216.6
Theta star	1384		
Nu star	10.16	**Potential UCLs to Use**	
AppChi2	4.042	97.5% KM (Chebyshev) UCL	145.7
95% Gamma Approximate UCL	490.8		
95% Adjusted Gamma UCL	513		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(B)FLUORANTHENE (ug/kg)

General Statistics

Number of Valid Samples	36	Number of Detected Data	15
Number of Unique Samples	13	Number of Non-Detect Data	21
		Percent Non-Detects	58.33%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	4.9	Minimum Detected	1.589
Maximum Detected	725	Maximum Detected	6.586
Mean of Detected	75.45	Mean of Detected	3.044
SD of Detected	183	SD of Detected	1.427
Minimum Non-Detect	1.7	Minimum Non-Detect	0.531
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	27
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	9
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	75.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.419	Shapiro Wilk Test Statistic	0.885
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	32.17	Mean	1.272
SD	121.6	SD	1.812
95% DL/2 (t) UCL	66.39	95% H-Stat (DL/2) UCL	16.5

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	0.616
		SD in Log Scale	2.543
		Mean in Original Scale	31.85
		SD in Original Scale	121.6
		95% Percentile Bootstrap UCL	72.27
		95% BCA Bootstrap UCL	96.44

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.442	**Data appear Lognormal at 5% Significance Level**	
Theta Star	170.7		
nu star	13.26		
A-D Test Statistic	1.522	**Nonparametric Statistics**	
5% A-D Critical Value	0.794	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.794	Mean	34.32
5% K-S Critical Value	0.234	SD	119.3
Data not Gamma Distributed at 5% Significance Level		SE of Mean	20.58
		95% KM (t) UCL	69.09
Assuming Gamma Distribution		95% KM (z) UCL	68.17
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	68.23
Minimum	0	95% KM (bootstrap t) UCL	202.7
Maximum	725	95% KM (BCA) UCL	73.61
Mean	139.3	95% KM (Percentile Bootstrap) UCL	73.77
Median	36.01	95% KM (Chebyshev) UCL	124
SD	200.4	97.5% KM (Chebyshev) UCL	162.9
k star	0.159	99% KM (Chebyshev) UCL	239.1
Theta star	874.6		
Nu star	11.47	**Potential UCLs to Use**	
AppChi2	4.88	95% KM (BCA) UCL	73.61
95% Gamma Approximate UCL	327.5		
95% Adjusted Gamma UCL	341.1		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DIBENZO(A,H)ANTHRACENE (ug/kg)

General Statistics

Number of Valid Samples	36	Number of Detected Data	6
Number of Unique Samples	6	Number of Non-Detect Data	30
		Percent Non-Detects	83.33%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	16	Minimum Detected	2.773
Maximum Detected	681	Maximum Detected	6.524
Mean of Detected	136	Mean of Detected	3.792
SD of Detected	267.1	SD of Detected	1.377
Minimum Non-Detect	4.2	Minimum Non-Detect	1.435
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	30
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	6
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	83.33%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.525	Shapiro Wilk Test Statistic	0.714
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	24.81	Mean	1.369
SD	112.9	SD	1.251
95% DL/2 (t) UCL	56.59	95% H-Stat (DL/2) UCL	9.763

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-1.429
		SD in Log Scale	3.337
		Mean in Original Scale	23.17
		SD in Original Scale	113.2
		95% Percentile Bootstrap UCL	60.46
		95% BCA Bootstrap UCL	80.38

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.39	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	348.9		
nu star	4.678		
A-D Test Statistic	1.235	**Nonparametric Statistics**	
5% A-D Critical Value	0.732	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.732	Mean	36
5% K-S Critical Value	0.347	SD	109.1
Data not Gamma Distributed at 5% Significance Level		SE of Mean	19.92
		95% KM (t) UCL	69.66
Assuming Gamma Distribution		95% KM (z) UCL	68.77
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	65.08
Minimum	0	95% KM (bootstrap t) UCL	560.7
Maximum	22340	95% KM (BCA) UCL	92.17
Mean	5412	95% KM (Percentile Bootstrap) UCL	73.17
Median	2469	95% KM (Chebyshev) UCL	122.8
SD	6522	97.5% KM (Chebyshev) UCL	160.4
k star	0.246	99% KM (Chebyshev) UCL	234.2
Theta star	22028		
Nu star	17.69	**Potential UCLs to Use**	
AppChi2	9.167	95% KM (BCA) UCL	92.17
95% Gamma Approximate UCL	10444		
95% Adjusted Gamma UCL	10771		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

INDENO(1,2,3-CD)PYRENE (ug/kg)

General Statistics

Number of Valid Samples	36	Number of Detected Data	7
Number of Unique Samples	6	Number of Non-Detect Data	29
		Percent Non-Detects	80.56%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	5.9	Minimum Detected	1.775
Maximum Detected	517	Maximum Detected	6.248
Mean of Detected	155.6	Mean of Detected	3.944
SD of Detected	209.8	SD of Detected	1.74
Minimum Non-Detect	2.5	Minimum Non-Detect	0.916
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	30
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	6
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	83.33%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.753	Shapiro Wilk Test Statistic	0.918
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	31.66	Mean	1.099
SD	106.6	SD	1.647
95% DL/2 (t) UCL	61.67	95% H-Stat (DL/2) UCL	14.83

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-2.266
		SD in Log Scale	4.207
		Mean in Original Scale	30.5
		SD in Original Scale	106.9
		95% Percentile Bootstrap UCL	61.89
		95% BCA Bootstrap UCL	73.48

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.418	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	372.1		
nu star	5.853		
A-D Test Statistic	0.46	**Nonparametric Statistics**	
5% A-D Critical Value	0.748	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.748	Mean	35
5% K-S Critical Value	0.326	SD	104.1
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	18.74
		95% KM (t) UCL	66.67
Assuming Gamma Distribution		95% KM (z) UCL	65.83
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	60.67
Minimum	0	95% KM (bootstrap t) UCL	170.3
Maximum	11539	95% KM (BCA) UCL	90.58
Mean	2886	95% KM (Percentile Bootstrap) UCL	73.03
Median	1412	95% KM (Chebyshev) UCL	116.7
SD	3397	97.5% KM (Chebyshev) UCL	152.1
k star	0.258	99% KM (Chebyshev) UCL	221.5
Theta star	11172		
Nu star	18.6	**Potential UCLs to Use**	
AppChi2	9.825	95% KM (t) UCL	66.67
95% Gamma Approximate UCL	5463		
95% Adjusted Gamma UCL	5629		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,4,6-TRINITROTOLUENE (mg/kg)

General Statistics

Number of Valid Samples	60	Number of Detected Data	8
Number of Unique Samples	8	Number of Non-Detect Data	52
		Percent Non-Detects	86.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.43	Minimum Detected	-0.844
Maximum Detected	130	Maximum Detected	4.868
Mean of Detected	22.16	Mean of Detected	1.491
SD of Detected	44.39	SD of Detected	1.951
Minimum Non-Detect	0.051	Minimum Non-Detect	-2.976
Maximum Non-Detect	0.16	Maximum Non-Detect	-1.833

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	52
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	8
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	86.67%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.564	Lilliefors Test Statistic	0.948
5% Lilliefors Critical Value	0.818	5% Lilliefors Critical Value	0.818
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.011	Mean	-2.26
SD	17.06	SD	1.693
95% DL/2 (t) UCL	6.692	95% H-Stat (DL/2) UCL	0.477

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-7.447
		SD in Log Scale	5.275
		Mean in Original Scale	2.964
		SD in Original Scale	17.07
		95% Percentile Bootstrap UCL	7.166
		95% BCA Bootstrap UCL	9.74

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	0.338	**Data appear Gamma Distributed at 5% Significance Level**
Theta Star	65.49	
nu star	5.413	
A-D Test Statistic	0.569	**Nonparametric Statistics**
5% A-D Critical Value	0.778	Kaplan-Meier (KM) Method
K-S Test Statistic	0.778	Mean 3.327
5% K-S Critical Value	0.313	SD 16.87
Data appear Gamma Distributed at 5% Significance Level		SE of Mean 2.328
		95% KM (t) UCL 7.217
Assuming Gamma Distribution		95% KM (z) UCL 7.156
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL 6.834
Minimum	0	95% KM (bootstrap t) UCL 25.71
Maximum	180.1	95% KM (BCA) UCL 8.853
Mean	37.94	95% KM (Percentile Bootstrap) UCL 7.978
Median	12.66	95% KM (Chebyshev) UCL 13.47
SD	50.88	97.5% KM (Chebyshev) UCL 17.86
k star	0.107	99% KM (Chebyshev) UCL 26.49
Theta star	354.5	
Nu star	12.84	**Potential UCLs to Use**
AppChi2	5.786	95% KM (t) UCL 7.217
95% Gamma Approximate UCL	84.19	
95% Adjusted Gamma UCL	85.93	

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,4-DINITROTOLUENE (mg/kg)

General Statistics			
Number of Valid Samples	60	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	57
		Percent Non-Detects	95.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.4	Minimum Detected	-0.916
Maximum Detected	17	Maximum Detected	2.833
Mean of Detected	6.107	Mean of Detected	0.611
SD of Detected	9.437	SD of Detected	1.969
Minimum Non-Detect	0.073	Minimum Non-Detect	-2.617
Maximum Non-Detect	0.12	Maximum Non-Detect	-2.12

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	57
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	95.00%

UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.773	Lilliefors Test Statistic	0.907
5% Lilliefors Critical Value	0.767	5% Lilliefors Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.357	Mean	-2.76
SD	2.188	SD	0.883
95% DL/2 (t) UCL	0.829	95% H-Stat (DL/2) UCL	0.102
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-15.91
		SD in Log Scale	7.579
		Mean in Original Scale	0.306
		SD in Original Scale	2.196
		95% Percentile Bootstrap UCL	0.866
		95% BCA Bootstrap UCL	1.424
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.441	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.685
5% K-S Critical Value	N/A	SD	2.125
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.336
		95% KM (t) UCL	1.247
Assuming Gamma Distribution		95% KM (z) UCL	1.238
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.145
Minimum	N/A	95% KM (bootstrap t) UCL	7.369
Maximum	N/A	95% KM (BCA) UCL	17
Mean	N/A	95% KM (Percentile Bootstrap) UCL	17
Median	N/A	95% KM (Chebyshev) UCL	2.15
SD	N/A	97.5% KM (Chebyshev) UCL	2.784
k star	N/A	99% KM (Chebyshev) UCL	4.028
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	1.247
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	17
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,6-DINITROTOLUENE (mg/kg)

General Statistics

Number of Valid Samples	60	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	58
		Percent Non-Detects	96.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.1	Minimum Detected	0.0953
Maximum Detected	11	Maximum Detected	2.398
Mean of Detected	6.05	Mean of Detected	1.247
SD of Detected	7	SD of Detected	1.628
Minimum Non-Detect	0.099	Minimum Non-Detect	-2.313
Maximum Non-Detect	0.19	Maximum Non-Detect	-1.661

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	58
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	96.67%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	1	Lilliefors Test Statistic	1
5% Lilliefors Critical Value	N/A	5% Lilliefors Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.282	Mean	-2.393
SD	1.413	SD	0.762
95% DL/2 (t) UCL	0.587	95% H-Stat (DL/2) UCL	0.132

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**
Theta Star	N/A	
nu star	N/A	

A-D Test Statistic	0.357	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.265
5% K-S Critical Value	N/A	SD	1.267
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.231
		95% KM (t) UCL	1.652
Assuming Gamma Distribution		95% KM (z) UCL	1.646
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	7.694
Minimum	N/A	95% KM (bootstrap t) UCL	1.8E+308
Maximum	N/A	95% KM (BCA) UCL	11
Mean	N/A	95% KM (Percentile Bootstrap) UCL	11
Median	N/A	95% KM (Chebyshev) UCL	2.274
SD	N/A	97.5% KM (Chebyshev) UCL	2.71
k star	N/A	99% KM (Chebyshev) UCL	3.567
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (Chebyshev) UCL	2.274
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-4
EPC Calculation Results - Area A Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DNT Mix (mg/kg)

General Statistics

Number of Valid Samples	60	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	57
		Percent Non-Detects	95.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.495	Minimum Detected	-0.703
Maximum Detected	28	Maximum Detected	3.332
Mean of Detected	10.17	Mean of Detected	1.111
SD of Detected	15.46	SD of Detected	2.048
Minimum Non-Detect	0.099	Minimum Non-Detect	-2.313
Maximum Non-Detect	0.19	Maximum Non-Detect	-1.661

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	57
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	95.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.791	Lilliefors Test Statistic	0.97
5% Lilliefors Critical Value	0.767	5% Lilliefors Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.587	Mean	-2.34
SD	3.608	SD	0.922
95% DL/2 (t) UCL	1.366	95% H-Stat (DL/2) UCL	0.161

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-16.35
		SD in Log Scale	8.011
		Mean in Original Scale	0.509
		SD in Original Scale	3.619
		95% Percentile Bootstrap UCL	1.442
		95% BCA Bootstrap UCL	2.35

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**
Theta Star	N/A	
nu star	N/A	

A-D Test Statistic	0.355	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.979
5% K-S Critical Value	N/A	SD	3.523
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.557
		95% KM (t) UCL	1.91
Assuming Gamma Distribution		95% KM (z) UCL	1.895
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.083
Minimum	N/A	95% KM (bootstrap t) UCL	7.084
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	28
Median	N/A	95% KM (Chebyshev) UCL	3.407
SD	N/A	97.5% KM (Chebyshev) UCL	4.458
k star	N/A	99% KM (Chebyshev) UCL	6.522
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	1.91
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	28
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-5
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Full Data Sets

User Selected Options

From File	WorkSheet_a.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ALUMINUM (mg/kg)

General Statistics

Number of Valid Samples	17	Number of Unique Samples	16

Raw Statistics		**Log-transformed Statistics**	
Minimum	8690	Minimum of Log Data	9.07
Maximum	22600	Maximum of Log Data	10.03
Mean	14351	Mean of log Data	9.548
Median	13800	SD of log Data	0.224
SD	3206		
Coefficient of Variation	0.223		
Skewness	0.705		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.936	Shapiro Wilk Test Statistic	0.949
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	15708	95% H-UCL	15909
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17773
95% Adjusted-CLT UCL	15772	97.5% Chebyshev (MVUE) UCL	19253
95% Modified-t UCL	15730	99% Chebyshev (MVUE) UCL	22159

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	17.86	**Data appear Normal at 5% Significance Level**	
Theta Star	803.6		
nu star	607.2		
Approximate Chi Square Value (.05)	551	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	15630
Adjusted Chi Square Value	545.4	95% Jackknife UCL	15708
		95% Standard Bootstrap UCL	15599
Anderson-Darling Test Statistic	0.414	95% Bootstrap-t UCL	15804
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	16396
Kolmogorov-Smirnov Test Statistic	0.184	95% Percentile Bootstrap UCL	15583
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	15665
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17740
		97.5% Chebyshev(Mean, Sd) UCL	19207
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22088
95% Approximate Gamma UCL	15813		
95% Adjusted Gamma UCL	15976		

Potential UCL to Use		
	Use 95% Student's-t UCL	15708

Table C.10-5
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	16
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.44	Minimum of Log Data	-0.821
Maximum	5.1	Maximum of Log Data	1.629
Mean	1.565	Mean of log Data	0.258
Median	1.2	SD of log Data	0.621
SD	1.124		
Coefficient of Variation	0.718		
Skewness	2.135		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.795	Shapiro Wilk Test Statistic	0.986
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.041	95% H-UCL	2.197
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.613
95% Adjusted-CLT UCL	2.164	97.5% Chebyshev (MVUE) UCL	3.074
95% Modified-t UCL	2.065	99% Chebyshev (MVUE) UCL	3.979
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.331	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.671		
nu star	79.26		
Approximate Chi Square Value (.05)	59.75	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	2.014
Adjusted Chi Square Value	57.97	95% Jackknife UCL	2.041
		95% Standard Bootstrap UCL	2.012
Anderson-Darling Test Statistic	0.288	95% Bootstrap-t UCL	2.424
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	4.183
Kolmogorov-Smirnov Test Statistic	0.132	95% Percentile Bootstrap UCL	2.014
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	2.142
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.754
		97.5% Chebyshev(Mean, Sd) UCL	3.268
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.278
95% Approximate Gamma UCL	2.076		
95% Adjusted Gamma UCL	2.14		
Potential UCL to Use		Use 95% Approximate Gamma UCL	2.076

Table C.10-5
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CALCIUM (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	16
Raw Statistics		**Log-transformed Statistics**	
Minimum	636	Minimum of Log Data	6.455
Maximum	14900	Maximum of Log Data	9.609
Mean	2338	Mean of log Data	7.345
Median	1380	SD of log Data	0.761
SD	3409		
Coefficient of Variation	1.458		
Skewness	3.548		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.468	Shapiro Wilk Test Statistic	0.81
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	3782	95% H-UCL	3234
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3769
95% Adjusted-CLT UCL	4458	97.5% Chebyshev (MVUE) UCL	4524
95% Modified-t UCL	3900	99% Chebyshev (MVUE) UCL	6005
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.157	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	2022		
nu star	39.32		
Approximate Chi Square Value (.05)	25.96	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	3698
Adjusted Chi Square Value	24.82	95% Jackknife UCL	3782
		95% Standard Bootstrap UCL	3646
Anderson-Darling Test Statistic	2.113	95% Bootstrap-t UCL	10744
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	9610
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL	3875
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	4700
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5942
		97.5% Chebyshev(Mean, Sd) UCL	7501
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10564
95% Approximate Gamma UCL	3542		
95% Adjusted Gamma UCL	3704		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5942

Table C.10-5
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM (mg/kg)

General Statistics

Number of Valid Samples	17	Number of Unique Samples	16

Raw Statistics		**Log-transformed Statistics**	
Minimum	14.8	Minimum of Log Data	2.695
Maximum	41.6	Maximum of Log Data	3.728
Mean	22.34	Mean of log Data	3.077
Median	20.8	SD of log Data	0.24
SD	6.227		
Coefficient of Variation	0.279		
Skewness	2.092		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.78	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	24.97	95% H-UCL	24.91
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.99
95% Adjusted-CLT UCL	25.64	97.5% Chebyshev (MVUE) UCL	30.46
95% Modified-t UCL	25.1	99% Chebyshev (MVUE) UCL	35.32

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	14.04	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	1.591		
nu star	477.3		
Approximate Chi Square Value (.05)	427.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	24.82
Adjusted Chi Square Value	422.7	95% Jackknife UCL	24.97
		95% Standard Bootstrap UCL	24.76
Anderson-Darling Test Statistic	0.958	95% Bootstrap-t UCL	27.09
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	40.48
Kolmogorov-Smirnov Test Statistic	0.228	95% Percentile Bootstrap UCL	24.91
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	25.64
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28.92
		97.5% Chebyshev(Mean, Sd) UCL	31.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	37.36
95% Approximate Gamma UCL	24.93		
95% Adjusted Gamma UCL	25.22		

Potential UCL to Use		
	Use 95% Student's-t UCL	24.97
	or 95% Modified-t UCL	25.1

Table C.10-5
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	16
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.1	Minimum of Log Data	1.808
Maximum	12.2	Maximum of Log Data	2.501
Mean	8.776	Mean of log Data	2.149
Median	8.5	SD of log Data	0.22
SD	1.954		
Coefficient of Variation	0.223		
Skewness	0.474		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	9.604	95% H-UCL	9.707
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.83
95% Adjusted-CLT UCL	9.614	97.5% Chebyshev (MVUE) UCL	11.72
95% Modified-t UCL	9.613	99% Chebyshev (MVUE) UCL	13.46
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	18.15	**Data appear Normal at 5% Significance Level**	
Theta Star	0.483		
nu star	617.3		
Approximate Chi Square Value (.05)	560.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	9.556
Adjusted Chi Square Value	555	95% Jackknife UCL	9.604
		95% Standard Bootstrap UCL	9.524
Anderson-Darling Test Statistic	0.28	95% Bootstrap-t UCL	9.683
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	9.589
Kolmogorov-Smirnov Test Statistic	0.102	95% Percentile Bootstrap UCL	9.482
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	9.594
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.84
		97.5% Chebyshev(Mean, Sd) UCL	11.74
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.49
95% Approximate Gamma UCL	9.663		
95% Adjusted Gamma UCL	9.761		
Potential UCL to Use		Use 95% Student's-t UCL	9.604

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COPPER (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	3.3	Minimum of Log Data	1.194
Maximum	195	Maximum of Log Data	5.273
Mean	30.4	Mean of log Data	2.789
Median	13	SD of log Data	1.035
SD	47.29		
Coefficient of Variation	1.556		
Skewness	3.036		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.558	Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	50.42	95% H-UCL	56.38
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	58.8
95% Adjusted-CLT UCL	58.29	97.5% Chebyshev (MVUE) UCL	72.75
95% Modified-t UCL	51.83	99% Chebyshev (MVUE) UCL	100.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.806	**Data appear Lognormal at 5% Significance Level**	
Theta Star	37.73		
nu star	27.39		
Approximate Chi Square Value (.05)	16.45	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	49.26
Adjusted Chi Square Value	15.57	95% Jackknife UCL	50.42
		95% Standard Bootstrap UCL	49.16
Anderson-Darling Test Statistic	1.325	95% Bootstrap-t UCL	143.5
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	107.1
Kolmogorov-Smirnov Test Statistic	0.287	95% Percentile Bootstrap UCL	50.98
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	60.46
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.39
		97.5% Chebyshev(Mean, Sd) UCL	102
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	144.5
95% Approximate Gamma UCL	50.6		
95% Adjusted Gamma UCL	53.48		
Potential UCL to Use		Use 95% Chebyshev (MVUE) UCL	58.8

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IRON (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	15
Raw Statistics		**Log-transformed Statistics**	
Minimum	13200	Minimum of Log Data	9.488
Maximum	35100	Maximum of Log Data	10.47
Mean	21018	Mean of log Data	9.928
Median	19600	SD of log Data	0.228
SD	5014		
Coefficient of Variation	0.239		
Skewness	1.201		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.911	Shapiro Wilk Test Statistic	0.961
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	23141	95% H-UCL	23330
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26103
95% Adjusted-CLT UCL	23396	97.5% Chebyshev (MVUE) UCL	28309
95% Modified-t UCL	23200	99% Chebyshev (MVUE) UCL	32641
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	16.7	**Data appear Normal at 5% Significance Level**	
Theta Star	1258		
nu star	567.9		
Approximate Chi Square Value (.05)	513.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	23018
Adjusted Chi Square Value	508.2	95% Jackknife UCL	23141
		95% Standard Bootstrap UCL	22963
Anderson-Darling Test Statistic	0.352	95% Bootstrap-t UCL	23837
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	25168
Kolmogorov-Smirnov Test Statistic	0.147	95% Percentile Bootstrap UCL	23082
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	23400
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26319
		97.5% Chebyshev(Mean, Sd) UCL	28612
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	33118
95% Approximate Gamma UCL	23238		
95% Adjusted Gamma UCL	23486		
Potential UCL to Use		Use 95% Student's-t UCL	23141

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LEAD (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	16
Raw Statistics		**Log-transformed Statistics**	
Minimum	7.4	Minimum of Log Data	2.001
Maximum	3610	Maximum of Log Data	8.191
Mean	356.8	Mean of log Data	3.867
Median	29.8	SD of log Data	1.818
SD	921.5		
Coefficient of Variation	2.583		
Skewness	3.25		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.438	Shapiro Wilk Test Statistic	0.848
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	747	95% H-UCL	1596
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	662.6
95% Adjusted-CLT UCL	912.6	97.5% Chebyshev (MVUE) UCL	861.8
95% Modified-t UCL	776.3	99% Chebyshev (MVUE) UCL	1253
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.316	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	1127		
nu star	10.76		
Approximate Chi Square Value (.05)	4.421	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	724.4
Adjusted Chi Square Value	4.003	95% Jackknife UCL	747
		95% Standard Bootstrap UCL	717.7
Anderson-Darling Test Statistic	2.23	95% Bootstrap-t UCL	3980
Anderson-Darling 5% Critical Value	0.834	95% Hall's Bootstrap UCL	3182
Kolmogorov-Smirnov Test Statistic	0.312	95% Percentile Bootstrap UCL	750.1
Kolmogorov-Smirnov 5% Critical Value	0.226	95% BCA Bootstrap UCL	983.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1331
		97.5% Chebyshev(Mean, Sd) UCL	1753
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2581
95% Approximate Gamma UCL	868.1		
95% Adjusted Gamma UCL	958.8		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	2581

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MAGNESIUM (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	1120	Minimum of Log Data	7.021
Maximum	9040	Maximum of Log Data	9.109
Mean	3454	Mean of log Data	8.042
Median	3140	SD of log Data	0.467
SD	1782		
Coefficient of Variation	0.516		
Skewness	1.982		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.832	Shapiro Wilk Test Statistic	0.975
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	4208	95% H-UCL	4384
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5192
95% Adjusted-CLT UCL	4387	97.5% Chebyshev (MVUE) UCL	5949
95% Modified-t UCL	4243	99% Chebyshev (MVUE) UCL	7435
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.101	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	842.2		
nu star	139.4		
Approximate Chi Square Value (.05)	113.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	4165
Adjusted Chi Square Value	110.7	95% Jackknife UCL	4208
		95% Standard Bootstrap UCL	4143
Anderson-Darling Test Statistic	0.32	95% Bootstrap-t UCL	4595
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	7842
Kolmogorov-Smirnov Test Statistic	0.122	95% Percentile Bootstrap UCL	4229
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	4376
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5338
		97.5% Chebyshev(Mean, Sd) UCL	6153
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7754
95% Approximate Gamma UCL	4256		
95% Adjusted Gamma UCL	4351		
Potential UCL to Use		Use 95% Approximate Gamma UCL	4256

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MANGANESE (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	296	Minimum of Log Data	5.69
Maximum	883.5	Maximum of Log Data	6.784
Mean	536.2	Mean of log Data	6.238
Median	480	SD of log Data	0.313
SD	170.4		
Coefficient of Variation	0.318		
Skewness	0.585		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Test Statistic	0.96
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	608.3	95% H-UCL	622.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	715.9
95% Adjusted-CLT UCL	610.4	97.5% Chebyshev (MVUE) UCL	793.8
95% Modified-t UCL	609.3	99% Chebyshev (MVUE) UCL	946.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	9.04	**Data appear Normal at 5% Significance Level**	
Theta Star	59.31		
nu star	307.4		
Approximate Chi Square Value (.05)	267.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	604.2
Adjusted Chi Square Value	263.9	95% Jackknife UCL	608.3
		95% Standard Bootstrap UCL	602.5
Anderson-Darling Test Statistic	0.396	95% Bootstrap-t UCL	621.1
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	609.8
Kolmogorov-Smirnov Test Statistic	0.134	95% Percentile Bootstrap UCL	598.7
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	607
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	716.3
		97.5% Chebyshev(Mean, Sd) UCL	794.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	947.3
95% Approximate Gamma UCL	615.5		
95% Adjusted Gamma UCL	624.6		
Potential UCL to Use		Use 95% Student's-t UCL	608.3

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MERCURY (mg/kg)

General Statistics

Number of Valid Samples	17	Number of Unique Samples	16

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.02	Minimum of Log Data	-3.912
Maximum	0.77	Maximum of Log Data	-0.261
Mean	0.143	Mean of log Data	-2.591
Median	0.049	SD of log Data	1.08
SD	0.205		
Coefficient of Variation	1.436		
Skewness	2.433		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.623	Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.23	95% H-UCL	0.287
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.291
95% Adjusted-CLT UCL	0.256	97.5% Chebyshev (MVUE) UCL	0.361
95% Modified-t UCL	0.235	99% Chebyshev (MVUE) UCL	0.499

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.784	**Data appear Lognormal at 5% Significance Level**	
Theta Star	0.182		
nu star	26.65		
Approximate Chi Square Value (.05)	15.88	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	0.225
Adjusted Chi Square Value	15.02	95% Jackknife UCL	0.23
		95% Standard Bootstrap UCL	0.223
Anderson-Darling Test Statistic	1.144	95% Bootstrap-t UCL	0.397
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	0.602
Kolmogorov-Smirnov Test Statistic	0.217	95% Percentile Bootstrap UCL	0.23
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.262
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.36
		97.5% Chebyshev(Mean, Sd) UCL	0.454
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.638
95% Approximate Gamma UCL	0.24		
95% Adjusted Gamma UCL	0.254		

Potential UCL to Use			
		Use 95% Chebyshev (MVUE) UCL	0.291

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SELENIUM (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	14
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.56	Minimum of Log Data	-0.58
Maximum	2.6	Maximum of Log Data	0.956
Mean	1.317	Mean of log Data	0.206
Median	1.25	SD of log Data	0.389
SD	0.506		
Coefficient of Variation	0.384		
Skewness	0.864		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.95	Shapiro Wilk Test Statistic	0.983
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.531	95% H-UCL	1.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.872
95% Adjusted-CLT UCL	1.546	97.5% Chebyshev (MVUE) UCL	2.112
95% Modified-t UCL	1.536	99% Chebyshev (MVUE) UCL	2.582
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.122	**Data appear Normal at 5% Significance Level**	
Theta Star	0.215		
nu star	208.2		
Approximate Chi Square Value (.05)	175.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	1.519
Adjusted Chi Square Value	172.7	95% Jackknife UCL	1.531
		95% Standard Bootstrap UCL	1.51
Anderson-Darling Test Statistic	0.168	95% Bootstrap-t UCL	1.576
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	1.611
Kolmogorov-Smirnov Test Statistic	0.112	95% Percentile Bootstrap UCL	1.526
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	1.542
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.852
		97.5% Chebyshev(Mean, Sd) UCL	2.083
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.538
95% Approximate Gamma UCL	1.56		
95% Adjusted Gamma UCL	1.588		
Potential UCL to Use		Use 95% Student's-t UCL	1.531

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VANADIUM (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	16
Raw Statistics		**Log-transformed Statistics**	
Minimum	23	Minimum of Log Data	3.135
Maximum	58.9	Maximum of Log Data	4.076
Mean	35.43	Mean of log Data	3.537
Median	33.4	SD of log Data	0.246
SD	9.566		
Coefficient of Variation	0.27		
Skewness	1.39		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.854	Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	39.48	95% H-UCL	39.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	44.64
95% Adjusted-CLT UCL	40.08	97.5% Chebyshev (MVUE) UCL	48.65
95% Modified-t UCL	39.61	99% Chebyshev (MVUE) UCL	56.53
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	13.86	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	2.556		
nu star	471.2		
Approximate Chi Square Value (.05)	421.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	39.24
Adjusted Chi Square Value	417	95% Jackknife UCL	39.48
		95% Standard Bootstrap UCL	39.13
Anderson-Darling Test Statistic	0.721	95% Bootstrap-t UCL	41.42
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	42.78
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	39.22
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	39.86
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	45.54
		97.5% Chebyshev(Mean, Sd) UCL	49.92
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	58.51
95% Approximate Gamma UCL	39.57		
95% Adjusted Gamma UCL	40.03		
Potential UCL to Use		Use 95% Approximate Gamma UCL	39.57

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ZINC (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Unique Samples	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	47.1	Minimum of Log Data	3.852
Maximum	555	Maximum of Log Data	6.319
Mean	126.8	Mean of log Data	4.531
Median	66.7	SD of log Data	0.704
SD	137.6		
Coefficient of Variation	1.085		
Skewness	2.538		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.587	Shapiro Wilk Test Statistic	0.781
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	185.1	95% H-UCL	177.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	209.2
95% Adjusted-CLT UCL	203.7	97.5% Chebyshev (MVUE) UCL	249.1
95% Modified-t UCL	188.5	99% Chebyshev (MVUE) UCL	327.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.483	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	85.5		
nu star	50.43		
Approximate Chi Square Value (.05)	35.12	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	181.7
Adjusted Chi Square Value	33.79	95% Jackknife UCL	185.1
		95% Standard Bootstrap UCL	180.8
Anderson-Darling Test Statistic	2.094	95% Bootstrap-t UCL	333.8
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	420.2
Kolmogorov-Smirnov Test Statistic	0.306	95% Percentile Bootstrap UCL	186.7
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	207.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	272.3
		97.5% Chebyshev(Mean, Sd) UCL	335.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	458.9
95% Approximate Gamma UCL	182.1		
95% Adjusted Gamma UCL	189.3		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	272.3

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2,3,7,8-TCDD TEQ HH/Mammalian (pg/g)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	18
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0636	Minimum of Log Data	-2.755
Maximum	183.2	Maximum of Log Data	5.211
Mean	26.09	Mean of log Data	1.098
Median	1.598	SD of log Data	2.254
SD	55.51		
Coefficient of Variation	2.128		
Skewness	2.424		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.526	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	48.85	95% H-UCL	531.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	98.6
95% Adjusted-CLT UCL	55.6	97.5% Chebyshev (MVUE) UCL	130
95% Modified-t UCL	50.1	99% Chebyshev (MVUE) UCL	191.6
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.3	**Data appear Lognormal at 5% Significance Level**	
Theta Star	86.84		
nu star	10.82		
Approximate Chi Square Value (.05)	4.457	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	47.61
Adjusted Chi Square Value	4.072	95% Jackknife UCL	48.85
		95% Standard Bootstrap UCL	46.66
Anderson-Darling Test Statistic	1.408	95% Bootstrap-t UCL	111.2
Anderson-Darling 5% Critical Value	0.839	95% Hall's Bootstrap UCL	119
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	50.23
Kolmogorov-Smirnov 5% Critical Value	0.22	95% BCA Bootstrap UCL	56.54
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	83.12
		97.5% Chebyshev(Mean, Sd) UCL	107.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	156.3
95% Approximate Gamma UCL	63.3		
95% Adjusted Gamma UCL	69.29		
Potential UCL to Use		Use 99% Chebyshev (MVUE) UCL	191.6
Recommended UCL exceeds the maximum observation			

Table C.10-5
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,3,7,8-TCDD TEQ Avian (pg/g)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	18
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.232	Minimum of Log Data	-1.461
Maximum	322	Maximum of Log Data	5.774
Mean	39.74	Mean of log Data	1.501
Median	2.018	SD of log Data	2.221
SD	85.01		
Coefficient of Variation	2.139		
Skewness	2.668		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.542	Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	74.6	95% H-UCL	687.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	137.9
95% Adjusted-CLT UCL	86.16	97.5% Chebyshev (MVUE) UCL	181.6
95% Modified-t UCL	76.7	99% Chebyshev (MVUE) UCL	267.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.299	**Data appear Lognormal at 5% Significance Level**	
Theta Star	133.1		
nu star	10.75		
Approximate Chi Square Value (.05)	4.415	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	72.7
Adjusted Chi Square Value	4.031	95% Jackknife UCL	74.6
		95% Standard Bootstrap UCL	71.83
Anderson-Darling Test Statistic	1.381	95% Bootstrap-t UCL	123.7
Anderson-Darling 5% Critical Value	0.839	95% Hall's Bootstrap UCL	90.04
Kolmogorov-Smirnov Test Statistic	0.253	95% Percentile Bootstrap UCL	74.45
Kolmogorov-Smirnov 5% Critical Value	0.22	95% BCA Bootstrap UCL	83.94
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	127.1
		97.5% Chebyshev(Mean, Sd) UCL	164.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	239.1
95% Approximate Gamma UCL	96.76		
95% Adjusted Gamma UCL	106		
Potential UCL to Use		Use 99% Chebyshev (MVUE) UCL	267.5

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ANTIMONY (mg/kg)

General Statistics

Number of Valid Samples	15	Number of Detected Data	6
Number of Unique Samples	6	Number of Non-Detect Data	9
		Percent Non-Detects	60.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.44	Minimum Detected	-0.821
Maximum Detected	1.9	Maximum Detected	0.642
Mean of Detected	0.925	Mean of Detected	-0.275
SD of Detected	0.665	SD of Detected	0.664
Minimum Non-Detect	0.41	Minimum Non-Detect	-0.892
Maximum Non-Detect	1.9	Maximum Non-Detect	0.642

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	14
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	93.33%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.737	Shapiro Wilk Test Statistic	0.773
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.551	Mean	-0.922
SD	0.54	SD	0.771
95% DL/2 (t) UCL	0.796	95% H-Stat (DL/2) UCL	0.717
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-1.148
		SD in Log Scale	0.884
		Mean in Original Scale	0.483
		SD in Original Scale	0.548
		95% Percentile Bootstrap UCL	0.715
		95% BCA Bootstrap UCL	0.804

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.455	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.636		
nu star	17.46		
A-D Test Statistic	0.833	**Nonparametric Statistics**	
5% A-D Critical Value	0.702	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.702	Mean	0.642
5% K-S Critical Value	0.335	SD	0.457
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.131
		95% KM (t) UCL	0.873
Assuming Gamma Distribution		95% KM (z) UCL	0.858
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.853
Minimum	0.44	95% KM (bootstrap t) UCL	2.578
Maximum	1.9	95% KM (BCA) UCL	0.925
Mean	0.938	95% KM (Percentile Bootstrap) UCL	0.865
Median	0.96	95% KM (Chebyshev) UCL	1.214
SD	0.408	97.5% KM (Chebyshev) UCL	1.462
k star	4.968	99% KM (Chebyshev) UCL	1.949
Theta star	0.189		
Nu star	149	**Potential UCLs to Use**	
AppChi2	121.8	95% KM (t) UCL	0.873
95% Gamma Approximate UCL	1.148	95% KM (% Bootstrap) UCL	0.865
95% Adjusted Gamma UCL	1.177		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CADMIUM (mg/kg)

General Statistics

Number of Valid Samples	17	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	14
		Percent Non-Detects	82.35%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.05	Minimum Detected	-2.996
Maximum Detected	0.64	Maximum Detected	-0.446
Mean of Detected	0.347	Mean of Detected	-1.497
SD of Detected	0.295	SD of Detected	1.332
Minimum Non-Detect	0.03	Minimum Non-Detect	-3.507
Maximum Non-Detect	0.07	Maximum Non-Detect	-2.659

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	15
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	88.24%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	0.915
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0797	Mean	-3.408
SD	0.165	SD	1.046
95% DL/2 (t) UCL	0.149	95% H-Stat (DL/2) UCL	0.0756

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-6.381
		SD in Log Scale	2.938
		Mean in Original Scale	0.0629
		SD in Original Scale	0.171
		95% Percentile Bootstrap UCL	0.139
		95% BCA Bootstrap UCL	0.175

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		

A-D Test Statistic	0.312	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.102
5% K-S Critical Value	N/A	SD	0.152
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0451
		95% KM (t) UCL	0.181
Assuming Gamma Distribution		95% KM (z) UCL	0.176
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.297
Minimum	N/A	95% KM (bootstrap t) UCL	0.132
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	0.64
Median	N/A	95% KM (Chebyshev) UCL	0.299
SD	N/A	97.5% KM (Chebyshev) UCL	0.384
k star	N/A	99% KM (Chebyshev) UCL	0.551
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	0.181
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	0.64
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

4,4'-DDE (ug/kg)

General Statistics			
Number of Valid Samples	10	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	8
		Percent Non-Detects	80.00%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	7.6	Minimum Detected	2.028
Maximum Detected	60	Maximum Detected	4.094
Mean of Detected	33.8	Mean of Detected	3.061
SD of Detected	37.05	SD of Detected	1.461
Minimum Non-Detect	0.4	Minimum Non-Detect	-0.916
Maximum Non-Detect	3.92	Maximum Non-Detect	1.366
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	8
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	80.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7.715	Mean	0.5
SD	18.49	SD	1.68
95% DL/2 (t) UCL	18.43	95% H-Stat (DL/2) UCL	17.17
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.357	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	12.84
5% K-S Critical Value	N/A	SD	15.72
Data not Gamma Distributed at 5% Significance Level		SE of Mean	7.03
		95% KM (t) UCL	25.73
Assuming Gamma Distribution		95% KM (z) UCL	24.4
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	49.41
Minimum	N/A	95% KM (bootstrap t) UCL	1.8E+308
Maximum	N/A	95% KM (BCA) UCL	60
Mean	N/A	95% KM (Percentile Bootstrap) UCL	60
Median	N/A	95% KM (Chebyshev) UCL	43.48
SD	N/A	97.5% KM (Chebyshev) UCL	56.74
k star	N/A	99% KM (Chebyshev) UCL	82.79
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (BCA) UCL	60
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

HEPTACHLOR EPOXIDE (ug/kg)

General Statistics

Number of Valid Samples	10	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	8
		Percent Non-Detects	80.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	5.9	Minimum Detected	1.775
Maximum Detected	21	Maximum Detected	3.045
Mean of Detected	13.45	Mean of Detected	2.41
SD of Detected	10.68	SD of Detected	0.898
Minimum Non-Detect	0.26	Minimum Non-Detect	-1.347
Maximum Non-Detect	4.71	Maximum Non-Detect	1.55

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	8
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	80.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.772	Mean	0.296
SD	6.281	SD	1.647
95% DL/2 (t) UCL	7.413	95% H-Stat (DL/2) UCL	23.35

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**
Theta Star	N/A	
nu star	N/A	

A-D Test Statistic	0.359	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	7.41
5% K-S Critical Value	N/A	SD	4.53
Data not Gamma Distributed at 5% Significance Level		SE of Mean	2.026
		95% KM (t) UCL	11.12
Assuming Gamma Distribution		95% KM (z) UCL	10.74
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	17.95
Minimum	N/A	95% KM (bootstrap t) UCL	7.41
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	21
Median	N/A	95% KM (Chebyshev) UCL	16.24
SD	N/A	97.5% KM (Chebyshev) UCL	20.06
k star	N/A	99% KM (Chebyshev) UCL	27.57
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	11.12
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	21
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR 1254 (ug/kg)

General Statistics

Number of Valid Samples	10	Number of Detected Data	5
Number of Unique Samples	5	Number of Non-Detect Data	5
		Percent Non-Detects	50.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	15	Minimum Detected	2.708
Maximum Detected	2800	Maximum Detected	7.937
Mean of Detected	620.5	Mean of Detected	4.536
SD of Detected	1222	SD of Detected	2.182
Minimum Non-Detect	7.48	Minimum Non-Detect	2.012
Maximum Non-Detect	9	Maximum Non-Detect	2.197

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	5
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	5
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	50.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.606	Shapiro Wilk Test Statistic	0.873
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	312.3	Mean	2.973
SD	876.8	SD	2.198
95% DL/2 (t) UCL	820.6	95% H-Stat (DL/2) UCL	1289

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.234
		SD in Log Scale	3.862
		Mean in Original Scale	310.4
		SD in Original Scale	877.6
		95% Percentile Bootstrap UCL	849.3
		95% BCA Bootstrap UCL	1133

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	0.275	**Data appear Gamma Distributed at 5% Significance Level**
Theta Star	2256	
nu star	2.75	

A-D Test Statistic	0.612	**Nonparametric Statistics**	
5% A-D Critical Value	0.732	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.732	Mean	317.8
5% K-S Critical Value	0.378	SD	829.8
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	293.4
		95% KM (t) UCL	855.6
Assuming Gamma Distribution		95% KM (z) UCL	800.3
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	823.3
Minimum	0	95% KM (bootstrap t) UCL	26947
Maximum	2800	95% KM (BCA) UCL	876.7
Mean	621.3	95% KM (Percentile Bootstrap) UCL	855.3
Median	134.3	95% KM (Chebyshev) UCL	1597
SD	935.3	97.5% KM (Chebyshev) UCL	2150
k star	0.155	99% KM (Chebyshev) UCL	3237
Theta star	4017		
Nu star	3.093	**Potential UCLs to Use**	
AppChi2	0.401	95% KM (t) UCL	855.6
95% Gamma Approximate UCL	4797		
95% Adjusted Gamma UCL	6979		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR 1260 (ug/kg)

General Statistics

Number of Valid Samples	10	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	8
		Percent Non-Detects	80.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	24	Minimum Detected	3.178
Maximum Detected	380	Maximum Detected	5.94
Mean of Detected	202	Mean of Detected	4.559
SD of Detected	251.7	SD of Detected	1.953
Minimum Non-Detect	9.2	Minimum Non-Detect	2.219
Maximum Non-Detect	14.1	Maximum Non-Detect	2.646

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	8
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	80.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	44.76	Mean	2.259
SD	117.9	SD	1.383
95% DL/2 (t) UCL	113.1	95% H-Stat (DL/2) UCL	57.52

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		

A-D Test Statistic	0.356	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	59.6
5% K-S Critical Value	N/A	SD	106.8
Data not Gamma Distributed at 5% Significance Level		SE of Mean	47.76
		95% KM (t) UCL	147.2
Assuming Gamma Distribution		95% KM (z) UCL	138.2
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	308.1
Minimum	N/A	95% KM (bootstrap t) UCL	1.8E+308
Maximum	N/A	95% KM (BCA) UCL	380
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	267.8
SD	N/A	97.5% KM (Chebyshev) UCL	357.9
k star	N/A	99% KM (Chebyshev) UCL	534.8
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	97.5% KM (Chebyshev) UCL	357.9
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DIMETHYLPHTHALATE (ug/kg)

General Statistics			
Number of Valid Samples	17	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	15
		Percent Non-Detects	88.24%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1200	Minimum Detected	7.09
Maximum Detected	1900	Maximum Detected	7.55
Mean of Detected	1550	Mean of Detected	7.32
SD of Detected	495	SD of Detected	0.325
Minimum Non-Detect	380	Minimum Non-Detect	5.94
Maximum Non-Detect	1600	Maximum Non-Detect	7.378
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	16
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	94.12%
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	395.6	Mean	5.624
SD	474.4	SD	0.725
95% DL/2 (t) UCL	596.5	95% H-Stat (DL/2) UCL	422.4
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.359	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1241
5% K-S Critical Value	N/A	SD	164.7
Data not Gamma Distributed at 5% Significance Level		SE of Mean	56.49
		95% KM (t) UCL	1340
Assuming Gamma Distribution		95% KM (z) UCL	1334
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1709
Minimum	N/A	95% KM (bootstrap t) UCL	1241
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	1487
SD	N/A	97.5% KM (Chebyshev) UCL	1594
k star	N/A	99% KM (Chebyshev) UCL	1803
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	1340
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ACENAPHTHENE (ug/kg)

General Statistics

Number of Valid Samples	17	Number of Detected Data	5
Number of Unique Samples	5	Number of Non-Detect Data	12
		Percent Non-Detects	70.59%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	34	Minimum Detected	3.526
Maximum Detected	3500	Maximum Detected	8.161
Mean of Detected	1806	Mean of Detected	6.408
SD of Detected	1636	SD of Detected	2.192
Minimum Non-Detect	5.8	Minimum Non-Detect	1.758
Maximum Non-Detect	5.9	Maximum Non-Detect	1.775

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	12
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	5
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	70.59%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.843	Shapiro Wilk Test Statistic	0.796
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	533.3	Mean	2.646
SD	1178	SD	2.732
95% DL/2 (t) UCL	1032	95% H-Stat (DL/2) UCL	4140

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.007
		SD in Log Scale	4.41
		Mean in Original Scale	532.9
		SD in Original Scale	1178
		95% Percentile Bootstrap UCL	1016
		95% BCA Bootstrap UCL	1122

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.362	**Data appear Normal at 5% Significance Level**	
Theta Star	4994		
nu star	3.616		
A-D Test Statistic	0.643	**Nonparametric Statistics**	
5% A-D Critical Value	0.707	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.707	Mean	555.2
5% K-S Critical Value	0.37	SD	1132
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	307
		95% KM (t) UCL	1091
Assuming Gamma Distribution		95% KM (z) UCL	1060
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1020
Minimum	0	95% KM (bootstrap t) UCL	1018
Maximum	3500	95% KM (BCA) UCL	3059
Mean	1347	95% KM (Percentile Bootstrap) UCL	2594
Median	1568	95% KM (Chebyshev) UCL	1893
SD	1235	97.5% KM (Chebyshev) UCL	2473
k star	0.136	99% KM (Chebyshev) UCL	3610
Theta star	9912		
Nu star	4.621	**Potential UCLs to Use**	
AppChi2	0.981	95% KM (t) UCL	1091
95% Gamma Approximate UCL	6344	95% KM (Percentile Bootstrap) UCL	2594
95% Adjusted Gamma UCL	7582		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(A)PYRENE (ug/kg)

General Statistics

Number of Valid Samples	17	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	14
		Percent Non-Detects	82.35%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	6.9	Minimum Detected	1.932
Maximum Detected	57	Maximum Detected	4.043
Mean of Detected	29.97	Mean of Detected	3.078
SD of Detected	25.28	SD of Detected	1.067
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	1.6	Maximum Non-Detect	0.47

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.982	Shapiro Wilk Test Statistic	0.979
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.947	Mean	0.359
SD	14.54	SD	1.351
95% DL/2 (t) UCL	12.1	95% H-Stat (DL/2) UCL	5.368

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-1.718
		SD in Log Scale	3.178
		Mean in Original Scale	5.598
		SD in Original Scale	14.68
		95% Percentile Bootstrap UCL	12.04
		95% BCA Bootstrap UCL	15.16

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		

A-D Test Statistic	0.25	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	10.97
5% K-S Critical Value	N/A	SD	12.35
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.669
		95% KM (t) UCL	17.38
Assuming Gamma Distribution		95% KM (z) UCL	17.01
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	23.66
Minimum	N/A	95% KM (bootstrap t) UCL	14.98
Maximum	N/A	95% KM (BCA) UCL	57
Mean	N/A	95% KM (Percentile Bootstrap) UCL	57
Median	N/A	95% KM (Chebyshev) UCL	26.96
SD	N/A	97.5% KM (Chebyshev) UCL	33.88
k star	N/A	99% KM (Chebyshev) UCL	47.47
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	17.38
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	57
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,4,6-TRINITROTOLUENE (mg/kg)

General Statistics

Number of Valid Samples	17	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	14
		Percent Non-Detects	82.35%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.45	Minimum Detected	-0.799
Maximum Detected	80	Maximum Detected	4.382
Mean of Detected	46.48	Mean of Detected	2.554
SD of Detected	41.23	SD of Detected	2.907
Minimum Non-Detect	0.16	Minimum Non-Detect	-1.833
Maximum Non-Detect	0.16	Maximum Non-Detect	-1.833

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Test Statistic	0.794
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	8.269	Mean	-1.629
SD	23.34	SD	2.245
95% DL/2 (t) UCL	18.15	95% H-Stat (DL/2) UCL	11.96

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-8.717
		SD in Log Scale	7.488
		Mean in Original Scale	8.208
		SD in Original Scale	23.37
		95% Percentile Bootstrap UCL	17.64
		95% BCA Bootstrap UCL	22.32

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**
Theta Star	N/A	
nu star	N/A	

A-D Test Statistic	0.535	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	8.574
5% K-S Critical Value	N/A	SD	22.54
Data not Gamma Distributed at 5% Significance Level		SE of Mean	6.694
		95% KM (t) UCL	20.26
Assuming Gamma Distribution		95% KM (z) UCL	19.58
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	45.99
Minimum	N/A	95% KM (bootstrap t) UCL	12.97
Maximum	N/A	95% KM (BCA) UCL	80
Mean	N/A	95% KM (Percentile Bootstrap) UCL	80
Median	N/A	95% KM (Chebyshev) UCL	37.75
SD	N/A	97.5% KM (Chebyshev) UCL	50.38
k star	N/A	99% KM (Chebyshev) UCL	75.18
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	20.26
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	80
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,4-DINITROTOLUENE (mg/kg)

General Statistics

Number of Valid Samples	17	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	15
		Percent Non-Detects	88.24%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.38	Minimum Detected	-0.968
Maximum Detected	11	Maximum Detected	2.398
Mean of Detected	5.69	Mean of Detected	0.715
SD of Detected	7.509	SD of Detected	2.38
Minimum Non-Detect	0.12	Minimum Non-Detect	-2.12
Maximum Non-Detect	0.12	Maximum Non-Detect	-2.12

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.722	Mean	-2.398
SD	2.65	SD	1.314
95% DL/2 (t) UCL	1.844	95% H-Stat (DL/2) UCL	0.373

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		

A-D Test Statistic	0.355	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.005
5% K-S Critical Value	N/A	SD	2.499
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.857
		95% KM (t) UCL	2.501
Assuming Gamma Distribution		95% KM (z) UCL	2.414
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	8.098
Minimum	N/A	95% KM (bootstrap t) UCL	1.8E+308
Maximum	N/A	95% KM (BCA) UCL	11
Mean	N/A	95% KM (Percentile Bootstrap) UCL	11
Median	N/A	95% KM (Chebyshev) UCL	4.741
SD	N/A	97.5% KM (Chebyshev) UCL	6.357
k star	N/A	99% KM (Chebyshev) UCL	9.533
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	99% KM (Chebyshev) UCL	9.533
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DNT Mix (mg/kg)

General Statistics

Number of Valid Samples	17	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	15
		Percent Non-Detects	88.24%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.475	Minimum Detected	-0.744
Maximum Detected	11.1	Maximum Detected	2.406
Mean of Detected	5.785	Mean of Detected	0.831
SD of Detected	7.509	SD of Detected	2.228
Minimum Non-Detect	0.19	Minimum Non-Detect	-1.661
Maximum Non-Detect	0.19	Maximum Non-Detect	-1.661

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.764	Mean	-1.979
SD	2.664	SD	1.195
95% DL/2 (t) UCL	1.892	95% H-Stat (DL/2) UCL	0.444
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.355	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.1
5% K-S Critical Value	N/A	SD	2.499
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.857
		95% KM (t) UCL	2.596
Assuming Gamma Distribution		95% KM (z) UCL	2.509
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	8.193
Minimum	N/A	95% KM (bootstrap t) UCL	1.8E+308
Maximum	N/A	95% KM (BCA) UCL	11.1
Mean	N/A	95% KM (Percentile Bootstrap) UCL	11.1
Median	N/A	95% KM (Chebyshev) UCL	4.836
SD	N/A	97.5% KM (Chebyshev) UCL	6.452
k star	N/A	99% KM (Chebyshev) UCL	9.628
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	99% KM (Chebyshev) UCL	9.628
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-6
EPC Calculation Results - Area B Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NITROGLYCERIN (mg/kg)

General Statistics			
Number of Valid Samples	17	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	15
		Percent Non-Detects	88.24%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	95.03	Minimum Detected	4.554
Maximum Detected	400	Maximum Detected	5.991
Mean of Detected	247.5	Mean of Detected	5.273
SD of Detected	215.6	SD of Detected	1.016
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	1	Maximum Non-Detect	0
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	15
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	88.24%
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	29.45	Mean	-0.533
SD	98.2	SD	2.411
95% DL/2 (t) UCL	71.04	95% H-Stat (DL/2) UCL	65.53
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.359	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	113
5% K-S Critical Value	N/A	SD	71.76
Data not Gamma Distributed at 5% Significance Level		SE of Mean	24.61
		95% KM (t) UCL	155.9
Assuming Gamma Distribution		95% KM (z) UCL	153.4
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	316.7
Minimum	N/A	95% KM (bootstrap t) UCL	113
Maximum	N/A	95% KM (BCA) UCL	400
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	220.3
SD	N/A	97.5% KM (Chebyshev) UCL	266.7
k star	N/A	99% KM (Chebyshev) UCL	357.9
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (BCA) UCL	400
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-7
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Full Data Sets

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ALUMINUM (mg/kg)

General Statistics

Number of Valid Samples	37	Number of Unique Samples	33

Raw Statistics		**Log-transformed Statistics**	
Minimum	6910	Minimum of Log Data	8.841
Maximum	22600	Maximum of Log Data	10.03
Mean	12843	Mean of log Data	9.428
Median	12800	SD of log Data	0.26
SD	3323		
Coefficient of Variation	0.259		
Skewness	0.632		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.973	Shapiro Wilk Test Statistic	0.988
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	13765	95% H-UCL	13882
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15274
95% Adjusted-CLT UCL	13802	97.5% Chebyshev (MVUE) UCL	16324
95% Modified-t UCL	13775	99% Chebyshev (MVUE) UCL	18385

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	14.34	**Data appear Normal at 5% Significance Level**	
Theta Star	895.8		
nu star	1061		
Approximate Chi Square Value (.05)	986.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0431	95% CLT UCL	13742
Adjusted Chi Square Value	983.3	95% Jackknife UCL	13765
		95% Standard Bootstrap UCL	13739
Anderson-Darling Test Statistic	0.132	95% Bootstrap-t UCL	13769
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	13849
Kolmogorov-Smirnov Test Statistic	0.0713	95% Percentile Bootstrap UCL	13706
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	13727
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15224
		97.5% Chebyshev(Mean, Sd) UCL	16255
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18278
95% Approximate Gamma UCL	13815		
95% Adjusted Gamma UCL	13858		

Potential UCL to Use		
	Use 95% Student's-t UCL	13765

Table C.10-7
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

CHROMIUM (mg/kg)

General Statistics			
Number of Valid Samples	37	Number of Unique Samples	33
Raw Statistics		**Log-transformed Statistics**	
Minimum	10.9	Minimum of Log Data	2.389
Maximum	41.6	Maximum of Log Data	3.728
Mean	20.35	Mean of log Data	2.974
Median	19.4	SD of log Data	0.278
SD	6.27		
Coefficient of Variation	0.308		
Skewness	1.714		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.847	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	22.09	95% H-UCL	22.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.43
95% Adjusted-CLT UCL	22.36	97.5% Chebyshev (MVUE) UCL	26.21
95% Modified-t UCL	22.14	99% Chebyshev (MVUE) UCL	29.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	11.78	**Data appear Lognormal at 5% Significance Level**	
Theta Star	1.727		
nu star	871.8		
Approximate Chi Square Value (.05)	804.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0431	95% CLT UCL	22.05
Adjusted Chi Square Value	801.5	95% Jackknife UCL	22.09
		95% Standard Bootstrap UCL	22
Anderson-Darling Test Statistic	0.861	95% Bootstrap-t UCL	22.53
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	22.99
Kolmogorov-Smirnov Test Statistic	0.156	95% Percentile Bootstrap UCL	22.08
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	22.52
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	24.84
		97.5% Chebyshev(Mean, Sd) UCL	26.79
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30.61
95% Approximate Gamma UCL	22.06		
95% Adjusted Gamma UCL	22.14		
Potential UCL to Use		Use 95% Student's-t UCL	22.09
		or 95% Modified-t UCL	22.14
		or 95% H-UCL	22.08

Table C.10-7
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COBALT (mg/kg)

General Statistics			
Number of Valid Samples	37	Number of Unique Samples	29
Raw Statistics		**Log-transformed Statistics**	
Minimum	4.5	Minimum of Log Data	1.504
Maximum	12.2	Maximum of Log Data	2.501
Mean	7.932	Mean of log Data	2.042
Median	7.5	SD of log Data	0.244
SD	1.93		
Coefficient of Variation	0.243		
Skewness	0.514		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.957	Shapiro Wilk Test Statistic	0.974
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.468	95% H-UCL	8.528
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.337
95% Adjusted-CLT UCL	8.483	97.5% Chebyshev (MVUE) UCL	9.943
95% Modified-t UCL	8.473	99% Chebyshev (MVUE) UCL	11.14
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	16.2	**Data appear Normal at 5% Significance Level**	
Theta Star	0.49		
nu star	1199		
Approximate Chi Square Value (.05)	1119	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0431	95% CLT UCL	8.454
Adjusted Chi Square Value	1116	95% Jackknife UCL	8.468
		95% Standard Bootstrap UCL	8.449
Anderson-Darling Test Statistic	0.283	95% Bootstrap-t UCL	8.501
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	8.496
Kolmogorov-Smirnov Test Statistic	0.107	95% Percentile Bootstrap UCL	8.427
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	8.443
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.315
		97.5% Chebyshev(Mean, Sd) UCL	9.914
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.09
95% Approximate Gamma UCL	8.495		
95% Adjusted Gamma UCL	8.52		
Potential UCL to Use		Use 95% Student's-t UCL	8.468

Table C.10-7
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

COPPER (mg/kg)

General Statistics			
Number of Valid Samples	35	Number of Unique Samples	35
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.39	Minimum of Log Data	-0.942
Maximum	320	Maximum of Log Data	5.768
Mean	27.65	Mean of log Data	2.333
Median	10.2	SD of log Data	1.305
SD	61.51		
Coefficient of Variation	2.224		
Skewness	3.976		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.424	Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical Value	0.934	Shapiro Wilk Critical Value	0.934
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	45.23	95% H-UCL	44.95
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	50.66
95% Adjusted-CLT UCL	52.22	97.5% Chebyshev (MVUE) UCL	62.57
95% Modified-t UCL	46.39	99% Chebyshev (MVUE) UCL	85.96
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.588	**Data appear Lognormal at 5% Significance Level**	
Theta Star	47		
nu star	41.18		
Approximate Chi Square Value (.05)	27.47	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0425	95% CLT UCL	44.75
Adjusted Chi Square Value	26.94	95% Jackknife UCL	45.23
		95% Standard Bootstrap UCL	44.41
Anderson-Darling Test Statistic	2.9	95% Bootstrap-t UCL	92
Anderson-Darling 5% Critical Value	0.8	95% Hall's Bootstrap UCL	107.4
Kolmogorov-Smirnov Test Statistic	0.274	95% Percentile Bootstrap UCL	46.76
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	55.34
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	72.97
		97.5% Chebyshev(Mean, Sd) UCL	92.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	131.1
95% Approximate Gamma UCL	41.44		
95% Adjusted Gamma UCL	42.26		
Potential UCL to Use		Use 95% H-UCL	44.95

Table C.10-7
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

IRON (mg/kg)

General Statistics			
Number of Valid Samples	37	Number of Unique Samples	33
Raw Statistics		**Log-transformed Statistics**	
Minimum	11600	Minimum of Log Data	9.359
Maximum	35100	Maximum of Log Data	10.47
Mean	19691	Mean of log Data	9.861
Median	19300	SD of log Data	0.233
SD	4692		
Coefficient of Variation	0.238		
Skewness	0.916		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.955	Shapiro Wilk Test Statistic	0.988
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	20993	95% H-UCL	21086
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	23006
95% Adjusted-CLT UCL	21083	97.5% Chebyshev (MVUE) UCL	24442
95% Modified-t UCL	21012	99% Chebyshev (MVUE) UCL	27263
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	17.52	**Data appear Normal at 5% Significance Level**	
Theta Star	1124		
nu star	1296		
Approximate Chi Square Value (.05)	1214	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0431	95% CLT UCL	20959
Adjusted Chi Square Value	1210	95% Jackknife UCL	20993
		95% Standard Bootstrap UCL	20929
Anderson-Darling Test Statistic	0.202	95% Bootstrap-t UCL	21066
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	21189
Kolmogorov-Smirnov Test Statistic	0.0725	95% Percentile Bootstrap UCL	21008
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	21036
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23053
		97.5% Chebyshev(Mean, Sd) UCL	24507
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	27365
95% Approximate Gamma UCL	21031		
95% Adjusted Gamma UCL	21091		
Potential UCL to Use		Use 95% Student's-t UCL	20993

Table C.10-7
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

LEAD (mg/kg)

General Statistics			
Number of Valid Samples	37	Number of Unique Samples	32
Raw Statistics		**Log-transformed Statistics**	
Minimum	4	Minimum of Log Data	1.386
Maximum	3610	Maximum of Log Data	8.191
Mean	250.8	Mean of log Data	3.011
Median	10.5	SD of log Data	1.767
SD	796.7		
Coefficient of Variation	3.177		
Skewness	3.622		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.35	Shapiro Wilk Test Statistic	0.729
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	471.9	95% H-UCL	262.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	237.8
95% Adjusted-CLT UCL	549.6	97.5% Chebyshev (MVUE) UCL	302.7
95% Modified-t UCL	484.9	99% Chebyshev (MVUE) UCL	430.3
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.273	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	917.7		
nu star	20.22		
Approximate Chi Square Value (.05)	11.02	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0431	95% CLT UCL	466.2
Adjusted Chi Square Value	10.72	95% Jackknife UCL	471.9
		95% Standard Bootstrap UCL	460
Anderson-Darling Test Statistic	7.346	95% Bootstrap-t UCL	841.8
Anderson-Darling 5% Critical Value	0.867	95% Hall's Bootstrap UCL	516.9
Kolmogorov-Smirnov Test Statistic	0.355	95% Percentile Bootstrap UCL	489.5
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	576
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	821.7
		97.5% Chebyshev(Mean, Sd) UCL	1069
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1554
95% Approximate Gamma UCL	460.4		
95% Adjusted Gamma UCL	473.1		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1554

Table C.10-7
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

MANGANESE (mg/kg)

General Statistics			
Number of Valid Samples	37	Number of Unique Samples	37
Raw Statistics		**Log-transformed Statistics**	
Minimum	159	Minimum of Log Data	5.069
Maximum	883.5	Maximum of Log Data	6.784
Mean	423.5	Mean of log Data	5.975
Median	370	SD of log Data	0.386
SD	169.6		
Coefficient of Variation	0.4		
Skewness	0.99		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	470.6	95% H-UCL	477.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	543.8
95% Adjusted-CLT UCL	474.2	97.5% Chebyshev (MVUE) UCL	596
95% Modified-t UCL	471.3	99% Chebyshev (MVUE) UCL	698.4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.446	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	65.7		
nu star	477		
Approximate Chi Square Value (.05)	427.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0431	95% CLT UCL	469.4
Adjusted Chi Square Value	425.3	95% Jackknife UCL	470.6
		95% Standard Bootstrap UCL	470.3
Anderson-Darling Test Statistic	0.428	95% Bootstrap-t UCL	477.6
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	476.6
Kolmogorov-Smirnov Test Statistic	0.101	95% Percentile Bootstrap UCL	468.6
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	469.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	545
		97.5% Chebyshev(Mean, Sd) UCL	597.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	700.9
95% Approximate Gamma UCL	472.7		
95% Adjusted Gamma UCL	475		
Potential UCL to Use		Use 95% Approximate Gamma UCL	472.7

Table C.10-7
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NICKEL (mg/kg)

General Statistics			
Number of Valid Samples	37	Number of Unique Samples	34
Raw Statistics		**Log-transformed Statistics**	
Minimum	7	Minimum of Log Data	1.946
Maximum	21.6	Maximum of Log Data	3.073
Mean	11.73	Mean of log Data	2.431
Median	11.2	SD of log Data	0.25
SD	3.08		
Coefficient of Variation	0.263		
Skewness	1.171		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.92	Shapiro Wilk Test Statistic	0.971
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12.58	95% H-UCL	12.62
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.85
95% Adjusted-CLT UCL	12.66	97.5% Chebyshev (MVUE) UCL	14.77
95% Modified-t UCL	12.6	99% Chebyshev (MVUE) UCL	16.57
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	14.97	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.783		
nu star	1108		
Approximate Chi Square Value (.05)	1032	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0431	95% CLT UCL	12.56
Adjusted Chi Square Value	1028	95% Jackknife UCL	12.58
		95% Standard Bootstrap UCL	12.54
Anderson-Darling Test Statistic	0.41	95% Bootstrap-t UCL	12.67
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	12.76
Kolmogorov-Smirnov Test Statistic	0.102	95% Percentile Bootstrap UCL	12.55
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	12.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.93
		97.5% Chebyshev(Mean, Sd) UCL	14.89
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.76
95% Approximate Gamma UCL	12.59		
95% Adjusted Gamma UCL	12.63		
Potential UCL to Use		Use 95% Approximate Gamma UCL	12.59

Table C.10-7
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

VANADIUM (mg/kg)

General Statistics			
Number of Valid Samples	37	Number of Unique Samples	35
Raw Statistics		**Log-transformed Statistics**	
Minimum	18.8	Minimum of Log Data	2.934
Maximum	58.9	Maximum of Log Data	4.076
Mean	32.55	Mean of log Data	3.452
Median	31.1	SD of log Data	0.246
SD	8.48		
Coefficient of Variation	0.261		
Skewness	1.239		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.908	Shapiro Wilk Test Statistic	0.969
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	34.9	95% H-UCL	34.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	38.31
95% Adjusted-CLT UCL	35.14	97.5% Chebyshev (MVUE) UCL	40.81
95% Modified-t UCL	34.95	99% Chebyshev (MVUE) UCL	45.74
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	15.41	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	2.113		
nu star	1140		
Approximate Chi Square Value (.05)	1063	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0431	95% CLT UCL	34.84
Adjusted Chi Square Value	1059	95% Jackknife UCL	34.9
		95% Standard Bootstrap UCL	34.79
Anderson-Darling Test Statistic	0.534	95% Bootstrap-t UCL	35.17
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	35.43
Kolmogorov-Smirnov Test Statistic	0.119	95% Percentile Bootstrap UCL	34.92
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	35.04
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	38.62
		97.5% Chebyshev(Mean, Sd) UCL	41.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	46.42
95% Approximate Gamma UCL	34.92		
95% Adjusted Gamma UCL	35.02		
Potential UCL to Use		Use 95% Approximate Gamma UCL	34.92

Table C.10-7
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Full Data Sets
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,3,7,8-TCDD TEQ (pg/g)

General Statistics			
Number of Valid Samples	51	Number of Unique Samples	51
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.00702	Minimum of Log Data	-4.959
Maximum	183.2	Maximum of Log Data	5.211
Mean	11.22	Mean of log Data	-0.918
Median	0.205	SD of log Data	2.623
SD	35.27		
Coefficient of Variation	3.143		
Skewness	4.129		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.406	Lilliefors Test Statistic	0.165
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	19.5	95% H-UCL	63.76
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.87
95% Adjusted-CLT UCL	22.4	97.5% Chebyshev (MVUE) UCL	44.35
95% Modified-t UCL	19.98	99% Chebyshev (MVUE) UCL	64.95
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.218	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	51.5		
nu star	22.23		
Approximate Chi Square Value (.05)	12.51	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0453	95% CLT UCL	19.35
Adjusted Chi Square Value	12.3	95% Jackknife UCL	19.5
		95% Standard Bootstrap UCL	19.32
Anderson-Darling Test Statistic	5.079	95% Bootstrap-t UCL	34.94
Anderson-Darling 5% Critical Value	0.9	95% Hall's Bootstrap UCL	48.68
Kolmogorov-Smirnov Test Statistic	0.263	95% Percentile Bootstrap UCL	20.51
Kolmogorov-Smirnov 5% Critical Value	0.137	95% BCA Bootstrap UCL	23.7
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	32.76
		97.5% Chebyshev(Mean, Sd) UCL	42.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	60.37
95% Approximate Gamma UCL	19.94		
95% Adjusted Gamma UCL	20.29		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	60.37

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ANTIMONY

General Statistics

Number of Valid Samples	30	Number of Detected Data	12
Number of Unique Samples	12	Number of Non-Detect Data	18
		Percent Non-Detects	60.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.33	Minimum Detected	-1.109
Maximum Detected	20.7	Maximum Detected	3.03
Mean of Detected	2.346	Mean of Detected	-0.29
SD of Detected	5.804	SD of Detected	1.191
Minimum Non-Detect	0.37	Minimum Non-Detect	-0.994
Maximum Non-Detect	1.9	Maximum Non-Detect	0.642

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	28
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	93.33%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.389	Shapiro Wilk Test Statistic	0.674
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.09	Mean	-0.997
SD	3.726	SD	0.979
95% DL/2 (t) UCL	2.246	95% H-Stat (DL/2) UCL	0.701
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.987
		SD in Log Scale	0.991
		Mean in Original Scale	1.091
		SD in Original Scale	3.724
		95% Percentile Bootstrap UCL	2.424
		95% BCA Bootstrap UCL	3.174

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.467	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	5.027		
nu star	11.2		
A-D Test Statistic	2.45	**Nonparametric Statistics**	
5% A-D Critical Value	0.781	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.781	Mean	1.155
5% K-S Critical Value	0.258	SD	3.647
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.696
		95% KM (t) UCL	2.336
Assuming Gamma Distribution		95% KM (z) UCL	2.299
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.306
Minimum	0.33	95% KM (bootstrap t) UCL	12.33
Maximum	20.7	95% KM (BCA) UCL	2.614
Mean	2.359	95% KM (Percentile Bootstrap) UCL	2.486
Median	1.623	95% KM (Chebyshev) UCL	4.186
SD	3.653	97.5% KM (Chebyshev) UCL	5.498
k star	1.041	99% KM (Chebyshev) UCL	8.075
Theta star	2.265		
Nu star	62.49	**Potential UCLs to Use**	
AppChi2	45.3	95% KM (BCA) UCL	2.614
95% Gamma Approximate UCL	3.254		
95% Adjusted Gamma UCL	3.315		

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

ARSENIC

General Statistics

Number of Valid Samples	37	Number of Detected Data	36
Number of Unique Samples	28	Number of Non-Detect Data	1
		Percent Non-Detects	2.70%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.35	Minimum Detected	-1.05
Maximum Detected	5.1	Maximum Detected	1.629
Mean of Detected	1.395	Mean of Detected	0.142
SD of Detected	0.995	SD of Detected	0.612
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.25	Maximum Non-Detect	-1.386

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.786	Shapiro Wilk Test Statistic	0.98
5% Shapiro Wilk Critical Value	0.935	5% Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.36	Mean	0.0817
SD	1.003	SD	0.705
95% DL/2 (t) UCL	1.639	95% H-Stat (DL/2) UCL	1.692
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.35	Mean in Log Scale	0.0996
SD	1.007	SD in Log Scale	0.656
95% MLE (t) UCL	1.629	Mean in Original Scale	1.363
95% MLE (Tiku) UCL	1.617	SD in Original Scale	0.999
		95% Percentile Bootstrap UCL	1.647
		95% BCA Bootstrap UCL	1.7

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	2.563	**Data appear Gamma Distributed at 5% Significance Level**
Theta Star	0.544	
nu star	184.5	
A-D Test Statistic	0.491	**Nonparametric Statistics**
5% A-D Critical Value	0.755	Kaplan-Meier (KM) Method
K-S Test Statistic	0.755	Mean 1.366
5% K-S Critical Value	0.148	SD 0.982
Data appear Gamma Distributed at 5% Significance Level		SE of Mean 0.164
		95% KM (t) UCL 1.643
Assuming Gamma Distribution		95% KM (z) UCL 1.636
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL 1.641
Minimum	0	95% KM (bootstrap t) UCL 1.733
Maximum	5.1	95% KM (BCA) UCL 1.671
Mean	1.357	95% KM (Percentile Bootstrap) UCL 1.638
Median	1.1	95% KM (Chebyshev) UCL 2.08
SD	1.007	97.5% KM (Chebyshev) UCL 2.389
k star	0.766	99% KM (Chebyshev) UCL 2.996
Theta star	1.771	
Nu star	56.69	**Potential UCLs to Use**
AppChi2	40.39	95% KM (BCA) UCL 1.671
95% Gamma Approximate UCL	1.905	
95% Adjusted Gamma UCL	1.933	

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

HEPTACHLOR EPOXIDE

General Statistics

Number of Valid Samples	26	Number of Detected Data	4
Number of Unique Samples	4	Number of Non-Detect Data	22
		Percent Non-Detects	84.62%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.6	Minimum Detected	0.956
Maximum Detected	530	Maximum Detected	6.273
Mean of Detected	139.9	Mean of Detected	3.012
SD of Detected	260.2	SD of Detected	2.338
Minimum Non-Detect	0.26	Minimum Non-Detect	-1.347
Maximum Non-Detect	4.91	Maximum Non-Detect	1.591

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	23
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	88.46%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.656	Shapiro Wilk Test Statistic	0.912
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	22.86	Mean	0.526
SD	103.5	SD	1.706
95% DL/2 (t) UCL	57.54	95% H-Stat (DL/2) UCL	10.76

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.335
		SD in Log Scale	3.802
		Mean in Original Scale	21.53
		SD in Original Scale	103.8
		95% Percentile Bootstrap UCL	61.82
		95% BCA Bootstrap UCL	83.7

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.254	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	551		
nu star	2.031		
A-D Test Statistic	0.515	**Nonparametric Statistics**	
5% A-D Critical Value	0.698	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.698	Mean	23.72
5% K-S Critical Value	0.416	SD	101.3
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	22.94
		95% KM (t) UCL	62.91
Assuming Gamma Distribution		95% KM (z) UCL	61.46
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	56.06
Minimum	0	95% KM (bootstrap t) UCL	623.3
Maximum	530	95% KM (BCA) UCL	N/A
Mean	124.7	95% KM (Percentile Bootstrap) UCL	85.41
Median	137.8	95% KM (Chebyshev) UCL	123.7
SD	105.9	97.5% KM (Chebyshev) UCL	167
k star	0.295	99% KM (Chebyshev) UCL	252
Theta star	422.8		
Nu star	15.34	**Potential UCLs to Use**	
AppChi2	7.497	95% KM (t) UCL	62.91
95% Gamma Approximate UCL	255.1		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR 1254

General Statistics

Number of Valid Samples	28	Number of Detected Data	9
Number of Unique Samples	9	Number of Non-Detect Data	19
		Percent Non-Detects	67.86%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	8.04	Minimum Detected	2.084
Maximum Detected	2800	Maximum Detected	7.937
Mean of Detected	734.5	Mean of Detected	4.911
SD of Detected	1140	SD of Detected	2.22
Minimum Non-Detect	6.8	Minimum Non-Detect	1.917
Maximum Non-Detect	9.52	Maximum Non-Detect	2.253

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	20
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	8
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	71.43%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.674	Shapiro Wilk Test Statistic	0.918
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	239	Mean	2.552
SD	711.1	SD	2.05
95% DL/2 (t) UCL	467.9	95% H-Stat (DL/2) UCL	165.4

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	0.049
		SD in Log Scale	3.982
		Mean in Original Scale	236.4
		SD in Original Scale	712
		95% Percentile Bootstrap UCL	486.4
		95% BCA Bootstrap UCL	551.4

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.335	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	2193		
nu star	6.028		

A-D Test Statistic	0.52	**Nonparametric Statistics**	
5% A-D Critical Value	0.791	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.791	Mean	241.5
5% K-S Critical Value	0.298	SD	697.4
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	139.8
		95% KM (t) UCL	479.7
Assuming Gamma Distribution		95% KM (z) UCL	471.5
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	466.1
Minimum	8.04	95% KM (bootstrap t) UCL	1192
Maximum	2800	95% KM (BCA) UCL	517.4
Mean	734.7	95% KM (Percentile Bootstrap) UCL	483.8
Median	746.9	95% KM (Chebyshev) UCL	850.9
SD	621.9	97.5% KM (Chebyshev) UCL	1115
k star	0.965	99% KM (Chebyshev) UCL	1633
Theta star	761.1		
Nu star	54.05	**Potential UCLs to Use**	
AppChi2	38.16	95% KM (t) UCL	479.7
95% Gamma Approximate UCL	1041		
95% Adjusted Gamma UCL	1064		

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

AROCLOR 1260

General Statistics			
Number of Valid Samples	28	Number of Detected Data	5
Number of Unique Samples	5	Number of Non-Detect Data	23
		Percent Non-Detects	82.14%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	24	Minimum Detected	3.178
Maximum Detected	510	Maximum Detected	6.234
Mean of Detected	262.8	Mean of Detected	5.171
SD of Detected	191.7	SD of Detected	1.214
Minimum Non-Detect	5.2	Minimum Non-Detect	1.649
Maximum Non-Detect	14.1	Maximum Non-Detect	2.646
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	23
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	5
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	82.14%
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.987	Shapiro Wilk Test Statistic	0.875
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	51.54	Mean	2.322
SD	124.5	SD	1.446
95% DL/2 (t) UCL	91.62	95% H-Stat (DL/2) UCL	34.96
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	0.89
		SD in Log Scale	2.547
		Mean in Original Scale	49.04
		SD in Original Scale	125.5
		95% Percentile Bootstrap UCL	92.94
		95% BCA Bootstrap UCL	103.4
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.69	**Data appear Normal at 5% Significance Level**	
Theta Star	380.8		
nu star	6.901		
A-D Test Statistic	0.283	**Nonparametric Statistics**	
5% A-D Critical Value	0.687	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.687	Mean	66.64
5% K-S Critical Value	0.362	SD	116.7
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	24.65
		95% KM (t) UCL	108.6
Assuming Gamma Distribution		95% KM (z) UCL	107.2
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	140.7
Minimum	24	95% KM (bootstrap t) UCL	105.2
Maximum	536.3	95% KM (BCA) UCL	384.6
Mean	315	95% KM (Percentile Bootstrap) UCL	295
Median	314.4	95% KM (Chebyshev) UCL	174.1
SD	133	97.5% KM (Chebyshev) UCL	220.6
k star	3.585	99% KM (Chebyshev) UCL	311.9
Theta star	87.87		
Nu star	200.8	**Potential UCLs to Use**	
AppChi2	169	95% KM (t) UCL	108.6
95% Gamma Approximate UCL	374.3	95% KM (Percentile Bootstrap) UCL	295
95% Adjusted Gamma UCL	378.3		

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DIMETHYLPHTHALATE

General Statistics			
Number of Valid Samples	37	Number of Detected Data	4
Number of Unique Samples	4	Number of Non-Detect Data	33
		Percent Non-Detects	89.19%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	84	Minimum Detected	4.431
Maximum Detected	1900	Maximum Detected	7.55
Mean of Detected	1046	Mean of Detected	6.495
SD of Detected	748.5	SD of Detected	1.402
Minimum Non-Detect	350	Minimum Non-Detect	5.858
Maximum Non-Detect	1600	Maximum Non-Detect	7.378
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	36
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.30%
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.977	Shapiro Wilk Test Statistic	0.801
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	304.2	Mean	5.446
SD	353.8	SD	0.597
95% DL/2 (t) UCL	402.4	95% H-Stat (DL/2) UCL	296.2
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	4.686
		SD in Log Scale	1.095
		Mean in Original Scale	219.5
		SD in Original Scale	374.1
		95% Percentile Bootstrap UCL	324.6
		95% BCA Bootstrap UCL	361.2
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.474	**Data appear Normal at 5% Significance Level**	
Theta Star	2205		
nu star	3.796		
A-D Test Statistic	0.467	**Nonparametric Statistics**	
5% A-D Critical Value	0.665	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.665	Mean	189.6
5% K-S Critical Value	0.401	SD	368.7
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	70.39
		95% KM (t) UCL	308.4
Assuming Gamma Distribution		95% KM (z) UCL	305.4
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	759.8
Minimum	84	95% KM (bootstrap t) UCL	260.7
Maximum	2606	95% KM (BCA) UCL	N/A
Mean	1144	95% KM (Percentile Bootstrap) UCL	1238
Median	1006	95% KM (Chebyshev) UCL	496.4
SD	625.2	97.5% KM (Chebyshev) UCL	629.2
k star	2.737	99% KM (Chebyshev) UCL	889.9
Theta star	418		
Nu star	202.5	**Potential UCLs to Use**	
AppChi2	170.6	95% KM (t) UCL	308.4
95% Gamma Approximate UCL	1358	95% KM (Percentile Bootstrap) UCL	1238
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

BENZO(A)PYRENE

General Statistics

Number of Valid Samples	37	Number of Detected Data	8
Number of Unique Samples	8	Number of Non-Detect Data	29
		Percent Non-Detects	78.38%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	5.8	Minimum Detected	1.758
Maximum Detected	74	Maximum Detected	4.304
Mean of Detected	35.34	Mean of Detected	3.18
SD of Detected	27.76	SD of Detected	1.029
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	1.6	Maximum Non-Detect	0.47

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.885	Shapiro Wilk Test Statistic	0.889
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	8.268	Mean	0.513
SD	18.91	SD	1.491
95% DL/2 (t) UCL	13.52	95% H-Stat (DL/2) UCL	5.567
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.107
		SD in Log Scale	2.387
		Mean in Original Scale	8.466
		SD in Original Scale	18.87
		95% Percentile Bootstrap UCL	13.71
		95% BCA Bootstrap UCL	14.9

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.985	**Data appear Normal at 5% Significance Level**	
Theta Star	35.89		
nu star	15.76		
A-D Test Statistic	0.391	**Nonparametric Statistics**	
5% A-D Critical Value	0.729	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.729	Mean	12.19
5% K-S Critical Value	0.299	SD	17.14
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	3.012
		95% KM (t) UCL	17.27
Assuming Gamma Distribution		95% KM (z) UCL	17.14
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	16.45
Minimum	0	95% KM (bootstrap t) UCL	18.95
Maximum	314.2	95% KM (BCA) UCL	34
Mean	128.5	95% KM (Percentile Bootstrap) UCL	20.79
Median	108	95% KM (Chebyshev) UCL	25.31
SD	99.22	97.5% KM (Chebyshev) UCL	30.99
k star	0.538	99% KM (Chebyshev) UCL	42.15
Theta star	238.6		
Nu star	39.84	**Potential UCLs to Use**	
AppChi2	26.38	95% KM (t) UCL	17.27
95% Gamma Approximate UCL	194	95% KM (Percentile Bootstrap) UCL	20.79
95% Adjusted Gamma UCL	197.6		

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,4,6-TRINITROTOLUENE

General Statistics			
Number of Valid Samples	37	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	34
		Percent Non-Detects	91.89%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	59	Minimum Detected	4.078
Maximum Detected	80	Maximum Detected	4.382
Mean of Detected	69	Mean of Detected	4.226
SD of Detected	10.54	SD of Detected	0.152
Minimum Non-Detect	0.16	Minimum Non-Detect	-1.833
Maximum Non-Detect	0.45	Maximum Non-Detect	-0.799
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	91.89%
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.993	Shapiro Wilk Test Statistic	0.998
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.672	Mean	-1.95
SD	19.23	SD	1.868
95% DL/2 (t) UCL	11.01	95% H-Stat (DL/2) UCL	1.419
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	2.103	Mean in Log Scale	3.159
SD	68.26	SD in Log Scale	0.563
95% MLE (t) UCL	21.05	Mean in Original Scale	27.5
95% MLE (Tiku) UCL	60.01	SD in Original Scale	16.46
		95% Percentile Bootstrap UCL	32
		95% BCA Bootstrap UCL	32.27
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.249	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	59.81
5% K-S Critical Value	N/A	SD	3.668
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.738
		95% KM (t) UCL	61.06
Assuming Gamma Distribution		95% KM (z) UCL	61.03
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	65.58
Minimum	N/A	95% KM (bootstrap t) UCL	60.45
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	80
Median	N/A	95% KM (Chebyshev) UCL	63.03
SD	N/A	97.5% KM (Chebyshev) UCL	64.42
k star	N/A	99% KM (Chebyshev) UCL	67.16
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	61.06
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	80
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

2,4-Dinitrotoluene

General Statistics

Number of Valid Samples	37	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	34
		Percent Non-Detects	91.89%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.38	Minimum Detected	-0.968
Maximum Detected	160	Maximum Detected	5.075
Mean of Detected	57.13	Mean of Detected	2.168
SD of Detected	89.25	SD of Detected	3.028
Minimum Non-Detect	0.12	Minimum Non-Detect	-2.12
Maximum Non-Detect	0.12	Maximum Non-Detect	-2.12

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.8	Shapiro Wilk Test Statistic	0.996
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	4.687	Mean	-2.409
SD	26.3	SD	1.552
95% DL/2 (t) UCL	11.99	95% H-Stat (DL/2) UCL	0.453

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-18.76
		SD in Log Scale	11.17
		Mean in Original Scale	4.632
		SD in Original Scale	26.31
		95% Percentile Bootstrap UCL	13.27
		95% BCA Bootstrap UCL	21.62

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**
Theta Star	N/A	
nu star	N/A	

A-D Test Statistic	0.259	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	4.981
5% K-S Critical Value	N/A	SD	25.89
Data not Gamma Distributed at 5% Significance Level		SE of Mean	5.214
		95% KM (t) UCL	13.78
Assuming Gamma Distribution		95% KM (z) UCL	13.56
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	13.43
Minimum	N/A	95% KM (bootstrap t) UCL	52.55
Maximum	N/A	95% KM (BCA) UCL	160
Mean	N/A	95% KM (Percentile Bootstrap) UCL	160
Median	N/A	95% KM (Chebyshev) UCL	27.71
SD	N/A	97.5% KM (Chebyshev) UCL	37.54
k star	N/A	99% KM (Chebyshev) UCL	56.86
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	13.78
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	160
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DNT Mix

General Statistics

Number of Valid Samples	37	Number of Detected Data	3
Number of Unique Samples	3	Number of Non-Detect Data	34
		Percent Non-Detects	91.89%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.475	Minimum Detected	-0.744
Maximum Detected	160.1	Maximum Detected	5.076
Mean of Detected	57.22	Mean of Detected	2.246
SD of Detected	89.25	SD of Detected	2.913
Minimum Non-Detect	0.19	Minimum Non-Detect	-1.661
Maximum Non-Detect	0.19	Maximum Non-Detect	-1.661

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.8	Shapiro Wilk Test Statistic	0.998
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	4.727	Mean	-1.981
SD	26.31	SD	1.446
95% DL/2 (t) UCL	12.03	95% H-Stat (DL/2) UCL	0.561

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-17.96
		SD in Log Scale	10.78
		Mean in Original Scale	4.64
		SD in Original Scale	26.33
		95% Percentile Bootstrap UCL	13.28
		95% BCA Bootstrap UCL	17.93

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**
Theta Star	N/A	
nu star	N/A	

A-D Test Statistic	0.264	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	5.076
5% K-S Critical Value	N/A	SD	25.89
Data not Gamma Distributed at 5% Significance Level		SE of Mean	5.214
		95% KM (t) UCL	13.88
Assuming Gamma Distribution		95% KM (z) UCL	13.65
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	13.53
Minimum	N/A	95% KM (bootstrap t) UCL	52.64
Maximum	N/A	95% KM (BCA) UCL	160.1
Mean	N/A	95% KM (Percentile Bootstrap) UCL	160.1
Median	N/A	95% KM (Chebyshev) UCL	27.8
SD	N/A	97.5% KM (Chebyshev) UCL	37.64
k star	N/A	99% KM (Chebyshev) UCL	56.95
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	13.88
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	160.1
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Aminodinitrotoluenes

General Statistics

Number of Valid Samples	37	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	35
		Percent Non-Detects	94.59%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	23.6	Minimum Detected	3.161
Maximum Detected	66	Maximum Detected	4.19
Mean of Detected	44.8	Mean of Detected	3.675
SD of Detected	29.98	SD of Detected	0.727
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.469	Mean	-2.635
SD	11.41	SD	1.534
95% DL/2 (t) UCL	5.636	95% H-Stat (DL/2) UCL	0.355
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.359	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	24.75
5% K-S Critical Value	N/A	SD	6.876
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.599
		95% KM (t) UCL	27.44
Assuming Gamma Distribution		95% KM (z) UCL	27.38
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	52.43
Minimum	N/A	95% KM (bootstrap t) UCL	1.8E+308
Maximum	N/A	95% KM (BCA) UCL	66
Mean	N/A	95% KM (Percentile Bootstrap) UCL	66
Median	N/A	95% KM (Chebyshev) UCL	31.71
SD	N/A	97.5% KM (Chebyshev) UCL	34.73
k star	N/A	99% KM (Chebyshev) UCL	40.65
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	27.44
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL	66
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table C.10-8
EPC Calculation Results - Area B Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NITROGLYCERIN

General Statistics

Number of Valid Samples	37	Number of Detected Data	2
Number of Unique Samples	2	Number of Non-Detect Data	35
		Percent Non-Detects	94.59%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	95.03	Minimum Detected	4.554
Maximum Detected	400	Maximum Detected	5.991
Mean of Detected	247.5	Mean of Detected	5.273
SD of Detected	215.6	SD of Detected	1.016
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	1	Maximum Non-Detect	0

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	35
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	94.59%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	13.74	Mean	-0.931
SD	67.09	SD	1.809
95% DL/2 (t) UCL	32.36	95% H-Stat (DL/2) UCL	3.64

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		

A-D Test Statistic	0.359	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	103.3
5% K-S Critical Value	N/A	SD	49.46
Data not Gamma Distributed at 5% Significance Level		SE of Mean	11.5
		95% KM (t) UCL	122.7
Assuming Gamma Distribution		95% KM (z) UCL	122.2
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	302.4
Minimum	N/A	95% KM (bootstrap t) UCL	103.3
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	153.4
SD	N/A	97.5% KM (Chebyshev) UCL	175.1
k star	N/A	99% KM (Chebyshev) UCL	217.7
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (BCA) UCL	N/A
95% Gamma Approximate UCL	N/A		
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

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APPENDIX D

DATA QUALITY OBJECTIVES

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TABLE D-1
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Soil

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data usability.	There were no problems identified during field sampling that affected data usability.
Are samples representative of receptor exposure for this medium (e.g., sample depth, grab vs. composite, filtered vs. unfiltered, low flow, etc.)?	Yes. Samples are representative of receptor exposure. Surface soil samples and subsurface soil samples were collected from discrete intervals.
Assess the effect of field QC results on data usability.	Field duplicate samples were collected at the rate of 1 per 10 soil samples. The average concentration of the soil sample and its duplicate sample were used in the risk assessments. Equipment rinsate blank samples were collected at the rate of 1 per 20 soil samples. Low-level detections at concentrations below the laboratory reporting limit were reported in one or more of the equipment blank samples for selected metals, dioxins, and common laboratory contaminant bis(2-ethylhexyl)phlalate. No significant impact on data usability resulted from these detections. Matrix spike (MS)/matrix spike duplicate (MSD) samples were at the rate of 1 per 20 soil samples. No significant impact on data usability was identified based on the matrix spike results.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	No significant sampling issues were noted. See Sections 6.5.1 and 7.4.1 of the RFI/CMS Report discuss the uncertainty analysis for the human health and ecological risk assessments for sampling and analysis.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Low-level SW-846 analytical methods were used for soil analysis in accordance with the MWP and WPA No. 013. Soil samples were analyzed for SVOCs by SW-846 Method 8270C, PAHs by SW-846 Method 8310, explosives by SW-846 Methods 8330 and 8332, pesticides by SW-846 Method 8081A, PCBs by SW-846 Method 8082, PCB congeners by EPA Method 1668, dioxin/furans by SW-846 Method 8290, and metals by SW-846 6010B, 6020, and 7471A.
Were detection limits adequate?	Yes. Low-level SW-846 Methods were used. The detection limits were adequate for screening against adjusted RBCs.

TABLE D-1
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Soil

Activity	Comment
Summarize the effect of analytical technique issues on risk assessment, if applicable.	There were no analytical technical issues, which significantly affected the risk assessments. Sections 6.5.1 and 7.4.1 of the RFI/CMS Report discuss the uncertainty analysis for the human health and ecological risk assessments for sampling and analysis.
Data Quality Objectives	
Precision – How were duplicates handled?	Field duplicate samples were collected at the rate of 1 per 10 soil samples. The average concentration of the soil sample and its duplicate sample were used in the risk assessments.
Accuracy – How were split samples handled?	Split samples were not collected.
Representativeness – Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, COC problems, etc.).	No significant issues regarding data representativeness were noted.
Completeness – Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No significant issues regarding completeness of the data were noted. The overall completeness goal of 90$\pm$2% for field activities was exceeded for analytical analysis and field data collection.
Comparability – Indicate any problems associated with data comparability.	No significant issues regarding comparability of the data were noted.
Were the DQOs specified in the QAPP satisfied?	Yes, the DQOs specified in the QAPP were satisfied.
Summarize the effect of DQO issues on the risk assessment, if applicable.	Not applicable
Data Validation and Interpretation	
What are the data validation requirements for this region?	EPA Region III modifications to the National Functional Guidelines for Data Validation.
What method or guidance was used to validate the data?	EPA Region III National Functional Guidelines for Data Validation.
Was the data validation method consistent with regional guidance? Discuss any discrepancies.	Yes, there were no discrepancies.
Were all data qualifiers defined? Discuss those which were not.	Yes, they were defined in the guidance document, data validation reports included in Appendix H of the RFI/CMS Report, and in the data tables included in Section 4.0 of the RFI/CMS Report.
Which qualifiers represent usable data?	B, E, J, K, L, UJ, UL
Which qualifiers represent unusable data?	R

TABLE D-1
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Soil

Activity	Comment
How are tentatively identified compounds handled?	Detected tentatively identified compounds are qualified NJ. These compounds are not used in the risk assessments.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	Section 6.5.1 of the RFI/CMS Report discusses uncertainties associated with qualified data.
Additional notes:	None.

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Table D-1.1
Detected Analytes in Soil Field Blanks
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date	EQB-10 12/2/2002		MDL	RL	EQB-11 12/3/2002		MDL	RL	EQB-12 12/4/2002		MDL	RL	EQB-13 12/9/2002		MDL	RL	EQB-14 12/10/2002		MDL	RL	EQBK-1 1/10/2007		MDL	RL	EQBK-2 1/10/2007		MDL	RL	EQBK-4 1/11/2007		MDL	RL	EQBK-6 1/12/2007		MDL	RL
	Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (ug/L)																																				
Barium	0.91	B,B,p	0.2	10	0.4	B,B,p	0.2	10	0.33	B,B,p	0.2	10	0.37	B,B,p	0.2	10	0.37	B,B,p	0.2	10	NT				NT				NT				NT			
Calcium	<1,000	U,UL,o	9.6	1,000	21.8	B,B,o	9.6	1,000	14	B,B,o	9.6	1,000	12.3	B,B,o	9.6	1,000	22.6	B,B,o	9.6	1,000	NT				NT				NT				NT			
Chromium	0.77	B	0.6	5	<5	U	0.6	5	0.67	B	0.6	5	2	B	0.6	5	<5	U	0.6	5	NT				NT				NT				NT			
Copper	<5	U	1.4	5	<5	U	1.4	5	<5	U	1.4	5	<5	U	1.4	5	1.6	B	1.4	5	NT				NT				NT				NT			
Magnesium	61.2	B,B,p	6.1	1,000	59.8	B,B,p	6.1	1,000	62.2	B,B,p	6.1	1,000	60	B,B,p	6.1	1,000	60.7	B,B,p	6.1	1,000	NT				NT				NT				NT			
Manganese	<10	U	0.2	10	0.42	B,B,o	0.2	10	0.33	B,B,o	0.2	10	1.5	B	0.2	10	0.41	B,B,o	0.2	10	NT				NT				NT				NT			
Mercury	<0.2	U	0.1	0.2	<0.2	U	0.1	0.2	0.13	B,B,p	0.1	0.2	0.11	B,B,p	0.1	0.2	<0.2	U	0.1	0.2	NT				NT				NT				NT			
Selenium	<5	U	3.3	5	3.4	B,K,w	3.3	5	<5	U	3.3	5	<5	U	3.3	5	3.7	B,K,w	3.3	5	NT				NT				NT				NT			
Sodium	253	B,L,w	248.7	2,000	<2,000	U	248.7	2,000	<2,000	U	248.7	2,000	<2,000	U	248.7	2,000	<2,000	U	248.7	2,000	NT				NT				NT				NT			
Zinc	1.1	B,B,o	1	20	2.3	B,B,o	1	20	<20	U	1	20	1	B,B,o	1	20	<20	U,B,o	1	20	NT				NT				NT				NT			
TCL SVOCs (ug/L)																																				
Bis(2-ethylhexyl)phthalate	<10	U	1	10	10		1	10	<10	U	1	10	<10	U	1	10	<10	U	1	10	NT				NT				NT				NT			
Dioxin/Furans (ng/L)																																				
OCDD	NT				NT				NT				NT				NT				0.023	,B,z	0.00552	0.00552	0.0288	,B,z	0.00648	0.00648	0.0123	,B,z	0.00526	0.00526	0.0068	,B,z	0.00519	0.00519
1,2,3,4,6,7,8-HpCDD	NT				NT				NT				NT				NT				0.00303	,B,z	0.00276	0.00276	<0.00324	U	0.00324	0.00324	<0.00263	U	0.00263	0.00263	<0.00259	U	0.00259	0.00259
1,2,3,4,6,7,8-HpCDF	NT				NT				NT				NT				NT				0.00488		0.00276	0.00276	0.00368		0.00324	0.00324	0.000757		0.00263	0.00263	<0.00259	U	0.00259	0.00259
1,2,3,4,7,8,9-HpCDF	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.00244	,J,w	0.00324	0.00324	<0.00263	U	0.00263	0.00263	<0.00259	U	0.00259	0.00259
1,2,3,4,7,8-HxCDD	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.00383		0.00324	0.00324	<0.00263	U	0.00263	0.00263	<0.00259	U	0.00259	0.00259
1,2,3,4,7,8-HxCDF	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.00404		0.00324	0.00324	<0.00263	U	0.00263	0.00263	<0.00259	U	0.00259	0.00259
1,2,3,6,7,8-HxCDD	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.00381		0.00324	0.00324	<0.00263	U	0.00263	0.00263	<0.00259	U	0.00259	0.00259
1,2,3,6,7,8-HxCDF	NT				NT				NT				NT				NT				0.00296	,B,z	0.00276	0.00276	0.00383	,B,z	0.00324	0.00324	0.000484	,J,w	0.00263	0.00263	<0.00259	U	0.00259	0.00259
1,2,3,7,8,9-HxCDF	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.00355		0.00324	0.00324	<0.00263	U	0.00263	0.00263	<0.00259	U	0.00259	0.00259
1,2,3,7,8-PeCDD	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.0051	,B,z	0.00324	0.00324	0.000925	,B,z	0.00263	0.00263	<0.00259	U	0.00259	0.00259
1,2,3,7,8-PeCDF	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.00464	,B,z	0.00324	0.00324	0.00128	,J,w	0.00263	0.00263	0.00104	,B,z	0.00259	0.00259
2,3,4,6,7,8-HxCDF	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.00329		0.00324	0.00324	<0.00263	U	0.00263	0.00263	<0.00259	U	0.00259	0.00259
2,3,4,7,8-PeCDF	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.00433		0.00324	0.00324	<0.00263	U	0.00263	0.00263	0.000892		0.00259	0.00259
Total HpCDDs	NT				NT				NT				NT				NT				0.00303	,B,z	0.00287	0.00287	<0.00359	U	0.00359	0.00359	<0.00263	U	0.00263	0.00263	<0.00259	U	0.00259	0.00259
Total HpCDFs	NT				NT				NT				NT				NT				0.00488		0.00276	0.00276	0.00368		0.00324	0.00324	0.000757		0.00263	0.00263	<0.00259	U	0.00259	0.00259
Total HxCDDs	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.00764		0.00324	0.00324	<0.00263	U	0.00263	0.00263	<0.00259	U	0.00259	0.00259
Total HxCDFs	NT				NT				NT				NT				NT				0.0186		0.00276	0.00276	0.0147		0.00324	0.00324	<0.00263	U	0.00263	0.00263	<0.00259	U	0.00259	0.00259
Total PeCDDs	NT				NT				NT				NT				NT				<0.00276	U	0.00276	0.00276	0.0051	,B,z	0.00324	0.00324	0.000925	,B,z	0.00263	0.00263	<0.00259	U	0.00259	0.00259
Total PeCDFs	NT				NT				NT				NT				NT				0.0151		0.00276	0.00276	0.00896		0.00324	0.00324	<0.00263	U	0.00263	0.00263	0.00193	,B,z	0.00259	0.00259
Total TCDFs	NT				NT				NT				NT				NT				0.00636		0.00132	0.00132	<0.00121	U	0.00121	0.00121	<0.000871	U	0.000871	0.000871	<0.00102	U	0.00102	0.00102
PCB Congeners (pg/L)																																				
18,30-TrCB	NT				NT				NT				NT				NT				NT				7.08	,B,z	22.3	22.3	NT				NT			
20,28-TrCB	NT				NT				NT				NT				NT				NT				9.05	,B,z	22.3	22.3	NT				NT			
31-TrCB	NT				NT				NT				NT				NT				NT				9.63	,B,z	11.2	11.2	NT				NT			
44,47,65-TeCB	NT				NT				NT				NT				NT				NT				13.3	,B,z	33.5	33.5	NT				NT			
49,69-TeCB	NT				NT				NT				NT				NT				NT				9.81	,B,z	22.3	22.3	NT				NT			
52-TeCB	NT				NT				NT				NT				NT				NT				26.7	,B,z	11.2	11.2	NT				NT			
61,70,74,76-TeCB	NT				NT				NT				NT				NT				NT				19	,B,z	44.7	44.7	NT				NT			
86,87,97,108,119,125-PeCB	NT				NT				NT				NT				NT				NT				14.4	,B,z	67	67	NT				NT			
90,101,113-PeCB	NT				NT				NT				NT				NT				NT				27.2	,B,z	33.5	33.5	NT				NT			
95-PeCB	NT				NT				NT				NT				NT				NT				25.1	,B,z	11.2	11.2	NT				NT			
99-PeCB	NT				NT				NT				NT				NT				NT				10.5	,B,z	11.2	11.2	NT				NT			
118-PeCB	NT				NT				NT				NT				NT				NT				14.9	,B,z	11.2	11.2	NT				NT			
129,138,163-HxCB	NT				NT				NT				NT				NT				NT				15.1	,B,z	33.5	33.5	NT				NT			
153,168-HxCB	NT				NT				NT				NT				NT				NT				16	,B,z	22.3	22.3	NT				NT			

Notes:

CAS = Chemical Abstracts Service
ft bgs = Feet Below Ground Surface
ng/L = Nanogram Per Liter
µg/L = Microgram Per Liter
pg/L = Picogram Per Liter
TAL = Target Analyte List
TCL = Target Compound List
SVOC = Semivolatile Organic Compound
MDL = Method Detection Limit
RL = Reporting Limit
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code
NT = Not Tested

Data Qualifiers

B Analyte found in associated blank as well as in the sample.
J Estimated value.
,J Analyte present. Reported value may not be accurate or precise.
K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
U The compound was analyzed for but not detected. The reporting limit will be adjusted to reflect any dilution, and for soil, the percent moisture.
UL Not detected, quantitation limit is probably higher.

Inorganics and Conventionals
o Calibration blank contamination
p Preparation blank contamination
w Laboratory storage blank contamination

GC and HPLC Organics
w Field and/or equipment blank contamination
z Method blank and/or storage blank contamination

Note: 1. Source of Data Qualifier Codes: United States Environmental Protection Agency (USEPA) Region III Modifications to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses, April 1993.
2. Source of Data Qualifier Codes: United States Environmental Protection Agency (USEPA) Region III Modifications to National Functional Guidelines for Organic Data Review Multimedia, Multi-Concentration (OLMO1.0-OLMO1.9), September 1994.

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TABLE D-2
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Groundwater

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data usability.	There were no problems identified during field sampling that affected data usability.
Are samples representative of receptor exposure for this medium (e.g., sample depth, grab vs. composite, filtered vs. unfiltered, low flow, etc.)?	Yes. Groundwater samples collected from monitoring wells were used in the risk assessment. Direct push samples were not used in the risk assessment but were used in the nature and extent assessment and to assist in locating permanent monitoring well locations. The monitoring wells are screened within the uppermost portion of the alluvial and weathered bedrock aquifer. Both filtered and unfiltered samples were collected for metals. Filtered metals samples were used in the risk assessment and are considered representative of dissolved concentrations in groundwater. Low-flow groundwater sampling techniques were used to collect the samples representative of groundwater quality.
Assess the effect of field QC results on data usability.	Field duplicate samples were collected at the rate of 1 per 10 groundwater samples. The average concentration of the groundwater sample and its duplicate sample were used in the risk assessments. Equipment rinsate blank samples were collected at the rate of 1 per 20 groundwater samples. Low-level detections at concentrations below the laboratory reporting limit were reported in one or more of the equipment blank samples for selected metals and in one equipment blank sample for dioxins. No significant impact on data usability resulted from these detections. Matrix spike (MS)/matrix spike duplicate (MSD) samples were at the rate of 1 per 20 groundwater samples. No significant impact on data usability was identified based on the matrix spike results.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	No significant sampling issues were noted. See Sections 6.5.1 of the RFI/CMS Report discuss the uncertainty analysis for the human health risk assessment for sampling and analysis.

TABLE D-2
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Groundwater

Activity	Comment
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Low-level SW-846 and EPA analytical methods were used for groundwater analysis in accordance with the MWP and WPA No. 013. Groundwater samples were analyzed for SVOCs by SW-846 Method 8270C, PAHs by SW-846 Method 8310, explosives by SW-846 Methods 8330 and 8332, pesticides by SW-846 Method 8081A, PCBs by SW-846 Method 8082, dioxin/furans by SW-846 Method 8290, and metals by SW-846 6010B, 6020, and 7470A, and perchlorate by Method EPA 314 (prior to 2007) and SW-846 Method 6850 (2007).
Were detection limits adequate?	Yes. Low-level SW-846 Methods were used. The detection limits were adequate for screening against adjusted RBCs.
Summarize the effect of analytical technique issues on risk assessment, if applicable.	There were no analytical technical issues, which significantly affected the risk assessments. Section 6.5.1 of the RFI/CMS Report discusses the uncertainty analysis for the human health for sampling and analysis.
Data Quality Objectives	
Precision – How were duplicates handled?	Field duplicate samples were collected at the rate of 1 per 10 groundwater samples. The average concentration of the groundwater sample and its duplicate sample were used in the risk assessment.
Accuracy – How were split samples handled?	Split samples were not collected.
Representativeness – Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, COC problems, etc.).	No significant issues regarding data representativeness were noted.
Completeness – Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No significant issues regarding completeness of the data were noted. The overall completeness goal of 90$\pm$2% for field activities was exceeded for analytical analysis and field data collection.
Comparability – Indicate any problems associated with data comparability.	No significant issues regarding comparability of the data were noted.
Were the DQOs specified in the QAPP satisfied?	Yes, the DQOs specified in the QAPP were satisfied.
Summarize the effect of DQO issues on the risk assessment, if applicable.	Not applicable

TABLE D-2
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Groundwater

Activity	Comment
Data Validation and Interpretation	
What are the data validation requirements for this region?	EPA Region III modifications to the National Functional Guidelines for Data Validation.
What method or guidance was used to validate the data?	EPA Region III National Functional Guidelines for Data Validation.
Was the data validation method consistent with regional guidance? Discuss any discrepancies.	Yes, there were no discrepancies.
Were all data qualifiers defined? Discuss those which were not.	Yes, they were defined in the guidance document, data validation reports included in Appendix H of the RFI/CMS Report, and in the data tables included in Section 4 of the RFI/CMS Report.
Which qualifiers represent usable data?	B, E, J, K, L, UJ, UL
Which qualifiers represent unusable data?	R
How are tentatively identified compounds handled?	Detected tentatively identified compounds are qualified NJ. These compounds are not used in the risk assessment.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	Section 6.5.1 of the RFI/CMS Report discusses uncertainties associated with qualified data.
Additional notes:	None.

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Table D-2.1
Detected Analyes in Groundwater Field Blanks
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date	GW-EB-1 3/3/2003		MDL	RL	GW-EB-2 3/4/2003		MDL	RL	MWEQB-5 8/25/2004		MDL	RL	EQB-1 8/17/2004		MDL	RL	EQB-2 8/18/2004		MDL	RL	EQB-3 8/19/2004		MDL	RL	EQBK-1 11/29/2006		MDL	RL	EB-1 3/28/2007		MDL	RL	EQ BLANK-1 6/5/2007		MDL	RL	EQBK-1 9/19/2007		MDL	RL
	Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r					Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (ug/L)																																								
Aluminum	37.6	B	29.5	100	<100	U	29.5	100	NT				<200	U	41.1	200	<200	U	41.1	200	<200	U	41.1	200	NT				NT				NT				NT			
Antimony	<10	U	1.8	10	<10	U	1.8	10	NT				0.986	J,B,o	0.682	5	<5	U	0.682	5	<5	U	0.682	5	NT				NT				NT				NT			
Barium	0.33	B	0.2	10	<10	U	0.2	10	NT				<20	U	4.69	20	<20	U	4.69	20	<20	U	4.69	20	NT				NT				NT				NT			
Barium, Dissolved	0.46	B,B,o	0.2	10	0.42	B,B,o	0.2	10	NT				--				--				--				NT				NT				NT				NT			
Calcium, Dissolved	42.3	B,B,o	7.9	1,000	54.9	B,B,o	7.9	1,000	NT				--				--				--				NT				NT				NT				NT			
Chromium	3.5	B	0.7	5	<5	U	0.7	5	NT				<5	U	0.261	5	<5	U	0.261	5	0.314	J,B,p	0.261	5	NT				NT				NT				NT			
Cobalt	5		0.9	5	<5	U	0.9	5	NT				<10	U	2.58	10	<10	U	2.58	10	<10	U	2.58	10	NT				NT				NT				NT			
Cobalt, Dissolved	0.77	B,L,o	0.5	5	0.62	B,L,o	0.5	5	NT				--				--				--				NT				NT				NT				NT			
Iron	34.4	B,B,o	15	100	<100	U	15	100	NT				13.93	J	7.72	100	<100	U	7.72	100	9.478	J	7.72	100	NT				NT				NT				NT			
Magnesium	12.8	B,B,o	7.4	1,000	<1,000	U	7.4	1,000	NT				<500	U,UL,o	63.5	500	<500	U,UL,o	63.5	500	<500	U,UL,o	63.5	500	NT				NT				NT				NT			
Magnesium, Dissolved	76.7	B,B,o	5.3	1,000	73.8	B,B,o	5.3	1,000	NT				--				--				--				NT				NT				NT				NT			
Manganese	0.93	B,B,o	0.2	10	0.43	B,B,o	0.2	10	NT				<10	U,UL,o	1.64	10	<10	U,UL,o	1.64	10	<10	U,UL,o	1.64	10	NT				NT				NT				NT			
Manganese, Dissolved	0.49	B,B,o	0.2	10	0.65	B,B,o	0.2	10	<10	U,UL,o	1.64	10	--				--				--				NT				NT				NT				NT			
Nickel, Dissolved	1.9	B,K,w	1	5	<5	U	1	5	NT				--				--				--				NT				NT				NT				NT			
Potassium, Dissolved	<1,000	U	68.4	1,000	97	B,B,o	68.4	1,000	NT				--				--				--				NT				NT				NT				NT			
Selenium	2.4	BN,B,p	2.1	5	5.2	N,B,p	2.1	5	NT				<2	U	0.249	2	<2	U	0.249	2	<2	U	0.249	2	NT				NT				NT				NT			
Sodium	529	B,L,o	235	2,000	386	B,L,o	235	2,000	NT				<700	U,UL,o	231	700	<700	U,UL,o	231	700	<700	U,UL,o	231	700	NT				NT				NT				NT			
Zinc	<20	U,UL,w	0.6	20	<20	U,UL,w	0.6	20	NT				<20	U,UL,o	4.44	20	<20	U,UL,o	4.44	20	7.216	J,L,o	4.44	20	NT				NT				NT				NT			
Dioxin/Furans (ng/L)																																								
OCDD	NT				NT				NT				NT				NT				NT				0.00782	A ,B,z	0.00543	0.00543	NT				<0.0956	U	0.0956	0.0956	NT			
OCDF	NT				NT				NT				NT				NT				NT				<0.00543	U	0.00543	0.00543	NT				0.0122	A,B,z	0.0956	0.0956	NT			
1,2,3,4,6,7,8-HpCDD	NT				NT				NT				NT				NT				NT				0.00119	A	0.00271	0.00271	NT				0.00761	A	0.0478	0.0478	NT			
1,2,3,4,6,7,8-HpCDF	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.00966	A,B,z	0.0478	0.0478	NT			
1,2,3,4,7,8,9-HpCDF	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.00843	A	0.0478	0.0478	NT			
1,2,3,4,7,8-HxCDD	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.0108	A,J,w	0.0478	0.0478	NT			
1,2,3,4,7,8-HxCDF	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.0146	A,B,z	0.0478	0.0478	NT			
1,2,3,6,7,8-HxCDD	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.00902	A	0.0478	0.0478	NT			
1,2,3,6,7,8-HxCDF	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.0164	A	0.0478	0.0478	NT			
1,2,3,7,8,9-HxCDD	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.011	A	0.0478	0.0478	NT			
1,2,3,7,8,9-HxCDF	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.0134	A	0.0478	0.0478	NT			
1,2,3,7,8-PeCDD	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.0177	A	0.0478	0.0478	NT			
1,2,3,7,8-PeCDF	NT				NT				NT				NT				NT				NT				0.000651	A	0.00271	0.00271	NT				0.0236	A	0.0478	0.0478	NT			
2,3,4,6,7,8-HxCDF	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.011	A,J,w	0.0478	0.0478	NT			
2,3,4,7,8-PeCDF	NT				NT				NT				NT				NT				NT				0.000782	A	0.00271	0.00271	NT				0.0178	A	0.0478	0.0478	NT			
2,3,7,8-TCDD	NT				NT				NT				NT				NT				NT				<0.00112	U	0.00112	0.00112	NT				0.00904	A	0.0096	0.0096	NT			
2,3,7,8-TCDF	NT				NT				NT				NT				NT				NT				<0.000608	U	0.000608	0.000608	NT				0.00524	A	0.0096	0.0096	NT			
Total HpCDD	NT				NT				NT				NT				NT				NT				0.00221		0.00271	0.00271	NT				0.00761		0.0478	0.0478	NT			
Total HpCDF	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.0181		0.0478	0.0478	NT			
Total HxCDD	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.02		0.0478	0.0478	NT			
Total HxCDF	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.0444		0.0478	0.0478	NT			
Total PeCDD	NT				NT				NT				NT				NT				NT				<0.00271	U	0.00271	0.00271	NT				0.0177		0.0478	0.0478	NT			
Total PeCDF	NT				NT				NT				NT				NT				NT				0.00143		0.00271	0.00271	NT				0.0415		0.0478	0.0478	NT			
Total TCDD	NT				NT				NT				NT				NT				NT				<0.00112	U	0.00112	0.00112	NT				0.00904		0.0096	0.0096	NT			
Total TCDF	NT				NT				NT				NT				NT				NT				<0.000608	U	0.000608	0.000608	NT				0.00524		0.0096	0.0096	NT			

Notes:

CAS = Chemical Abstracts Service
µg/L = Microgram Per Liter
ng/L = Nanogram Per Liter
TCL = Target Compound List
MDL = Method Detection Limit
RL = Reporting Limit
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code
NT = Not Tested

Data Qualifiers:
A = Amount detected is less than the Lower Detection Limit.
B = Not detected substantially above the level reported in laboratory or field blanks.
J = Analyte present. Reported value may not be accurate or precise.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
N = Presumptive evidence of a compound.
U = Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
m = MS/MSD recovery failure.
o = Calibration blank contamination
p = Preparation blank contamination
w = Identification criteria failure.
x = Field blank contamination.
z = Method blank contamination.

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TABLE D-3
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Surface Water and Sediment Pore Water – New River

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data usability.	There were no problems identified during field sampling that affected data usability.
Are samples representative of receptor exposure for this medium (e.g., sample depth, grab vs. composite, filtered vs. unfiltered, low flow, etc.)?	Yes. Unfiltered grab samples were collected for analysis and used in the risk assessment. Low-flow sampling was used to collect the sediment pore-water samples.
Assess the effect of field QC results on data usability.	Field duplicate samples were collected at the rate of 1 per 10 for surface water and for sediment pore-water samples. The average concentration of the surface water sample and sediment pore-water sample and their associated duplicate samples were used in the risk assessments. Equipment rinsate blank samples were not collected given that new disposable tubing, sampling equipment, and a peristaltic pump were used to collect the samples. Matrix spike (MS)/matrix spike duplicate (MSD) samples were at the rate of 1 per 20 surface water and sediment-pore water samples. No significant impact on data usability was identified based on the matrix spike results.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	No significant sampling issues were noted. See Sections 6.5.1 of the RFI/CMS Report discuss the uncertainty analysis for the human health risk assessment for sampling and analysis.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Low-level SW-846 and EPA analytical methods were used for surface water and sediment pore-water analysis in accordance with the MWP and WPA No. 013. Surface water and sediment-pore water samples were analyzed for explosives by SW-846 Methods 8330 and 8332 and perchlorate by Method EPA 314.
Were detection limits adequate?	Yes. Low-level SW-846 and EPA Methods were used. The detection limits were adequate for screening against adjusted RBCs.
Summarize the effect of analytical technique issues on risk assessment, if applicable.	There were no analytical technical issues, which significantly affected the risk assessments. Section 6.5.1 of the RFI/CMS Report discusses the uncertainty analysis for the human health for sampling and analysis.

TABLE D-3
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Surface Water and Sediment Pore Water – New River

Activity	Comment
Data Quality Objectives	
Precision – How were duplicates handled?	Field duplicate samples were collected at the rate of 1 per 10 for surface water and for sediment pore-water samples. The average concentration of the surface water sample and sediment pore-water sample and their associated duplicate samples were used in the risk assessments.
Accuracy – How were split samples handled?	Split samples were not collected.
Representativeness – Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, COC problems, etc.).	No significant issues regarding data representativeness were noted.
Completeness – Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No significant issues regarding completeness of the data were noted. The overall completeness goal of 90$\pm$2% for field activities was exceeded for analytical analysis and field data collection.
Comparability – Indicate any problems associated with data comparability.	No significant issues regarding comparability of the data were noted.
Were the DQOs specified in the QAPP satisfied?	Yes, the DQOs specified in the QAPP were satisfied.
Summarize the effect of DQO issues on the risk assessment, if applicable.	Not applicable
Data Validation and Interpretation	
What are the data validation requirements for this region?	EPA Region III modifications to the National Functional Guidelines for Data Validation.
What method or guidance was used to validate the data?	EPA Region III National Functional Guidelines for Data Validation.
Was the data validation method consistent with regional guidance? Discuss any discrepancies.	Yes, there were no discrepancies.
Were all data qualifiers defined? Discuss those which were not.	Yes, they were defined in the guidance document, data validation reports included in Appendix H of the RFI/CMS Report, and in the data tables included in Section 4.0 of the RFI/CMS Report.
Which qualifiers represent usable data?	J
Which qualifiers represent unusable data?	None
How are tentatively identified compounds handled?	Not applicable.

TABLE D-3
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Surface Water and Sediment Pore Water – New River

Activity	Comment
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	Section 6.5.1 of the RFI/CMS Report discusses uncertainties associated with qualified data.
Additional notes:	None.

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TABLE D-4
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Sediment – New River

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data usability.	There were no problems identified during field sampling that affected data usability.
Are samples representative of receptor exposure for this medium (e.g., sample depth, grab vs. composite, filtered vs. unfiltered, low flow, etc.)?	Yes. Grab samples were collected for analysis and use in the nature and extent and fate and transport assessments. Sediment data was not used in the risk assessment.
Assess the effect of field QC results on data usability.	Field duplicate samples were collected at the rate of 1 per 10 for sediment samples. The average concentration of the sediment sample and its associated duplicate sample were used in the risk assessments. Matrix spike (MS)/matrix spike duplicate (MSD) samples were at the rate of 1 per 20 sediment samples. No significant impact on data usability was identified based on the matrix spike results.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	No significant sampling issues were noted.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Low-level SW-846 analytical methods were used for sediment analysis in accordance with the MWP and WPA No. 013. Sediment samples were analyzed for explosives by SW-846 Methods 8330 and 8332 and metals by SW-846 Methods 6010, 6020, and 7471A.
Were detection limits adequate?	Yes. Low-level SW-846 and EPA Methods were used. The detection limits were adequate for screening against adjusted RBCs.
Summarize the effect of analytical technique issues on risk assessment, if applicable.	There were no analytical technical issues, which significantly affected the risk assessments. Section 6.5.1 of the RFI/CMS Report discusses the uncertainty analysis for human health risk assessment for sampling and analysis.
Data Quality Objectives	
Precision – How were duplicates handled?	Field duplicate samples were collected at the rate of 1 per 10 for sediment samples. The average concentration of the sediment sample and its associated duplicate sample were used in the nature and extent assessment and fate and transport assessment.
Accuracy – How were split samples handled?	Split samples were not collected.

TABLE D-4
DATA USABILITY WORKSHEET
SITE: SWMU 54
MEDIUM: Sediment – New River

Activity	Comment
Representativeness – Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, COC problems, etc.).	No significant issues regarding data representativeness were noted.
Completeness – Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No significant issues regarding completeness of the data were noted. The overall completeness goal of 90±2% for field activities was exceeded for analytical analysis and field data collection.
Comparability – Indicate any problems associated with data comparability.	No significant issues regarding comparability of the data were noted.
Were the DQOs specified in the QAPP satisfied?	Yes, the DQOs specified in the QAPP were satisfied.
Summarize the effect of DQO issues on the risk assessment, if applicable.	Not applicable.
Data Validation and Interpretation	
What are the data validation requirements for this region?	EPA Region III modifications to the National Functional Guidelines for Data Validation.
What method or guidance was used to validate the data?	EPA Region III National Functional Guidelines for Data Validation.
Was the data validation method consistent with regional guidance? Discuss any discrepancies.	Yes, there were no discrepancies.
Were all data qualifiers defined? Discuss those which were not.	Yes, they were defined in the guidance document, data validation reports included in Appendix H of the RFI/CMS Report, and in the data tables included in Section 4.0 of the RFI/CMS Report.
Which qualifiers represent usable data?	B, J, K, L, UJ
Which qualifiers represent unusable data?	None.
How are tentatively identified compounds handled?	Not applicable.
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	Section 6.5.1 of the RFI/CMS Report discusses uncertainties associated with qualified data.
Additional notes:	None.

APPENDIX E

HUMAN HEALTH RISK ASSESSMENT

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APPENDIX E.1

HHRA TABLES – AREA A

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Table E.1-1
Selection of Exposure Pathways - SWMU 54 - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil	Surface Soil	Surface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
		Air	Ambient Air Above Surface Soil (Particulates)[2]	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest subsurface soil from the site since maintenance does not include excavation.
						Dermal Absorption	None	Receptor is not likely to come in contact with subsurface soil from the site since maintenance does not include excavation.
		Air	Ambient Air Above Subsurface Soil (Particulates)[2]	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale particulates from ambient air above the subsurface soil since maintenance activities do not include excavation.
	Groundwater [1]	Groundwater	Groundwater	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest groundwater from the site during maintenance activities.
						Dermal Absorption	None	Receptor is not likely to contact groundwater from the site during maintenance activities.
		Air	Upward Migration of Vapors from Groundwater (Outdoors)[2]	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air.
			Upward Migration of Vapors from Groundwater (Indoors)[2]	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
			Vapors while Showering[2]	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
Future	Surface Soil	Surface Soil	Surface Soil	Commerical/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil while working on site.
						Dermal Absorption	Quant	Receptor could contact surface soil while working on site.
				Construction Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site during construction activities.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site during construction activities.
				Resident	Child	Ingestion	Quant	Receptor could ingest surface soil while living on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while living on site.
					Adult	Ingestion	Quant	Receptor could ingest surface soil while living on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while living on site.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Ambient Air Above Surface Soil (Particulates)[2]	Commerical/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil while working on site.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil.
				Resident	Child	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil while living on site.
					Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil while living on site.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
			Upward Migration of Vapors from Soil (Indoors)[2]	Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into building.[2]
				Resident	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.[2]
					Child	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.[2]

Table E.1-1
Selection of Exposure Pathways - SWMU 54 - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Subsurface Soil	Subsurface Soil	Subsurface Soil	Commerical/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
						Dermal Absorption	Quant	Receptor could contact subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
				Construction Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil from the site while during construction activities.
						Dermal Absorption	Quant	Receptor could come into contact with subsurface soil from the site during construction activities.
				Resident	Child	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a residence.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction of a residence.
					Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a residence.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction of a residence.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Ambient Air Above Subsurface Soil (Particulates)[2]	Commerical/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil during construction activities.
				Resident	Child	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from construction of a residence.
					Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from constuction of a residence.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
			Upward Migration of Vapors from Soil (Indoors)[2]	Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into building.[2]
				Resident	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.[2]
					Child	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.[2]

Table E.1-1
Selection of Exposure Pathways - SWMU 54 - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Groundwater[1]	Groundwater	Groundwater	Commercial/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply for industrial process.
				Construction Worker	Adult	Ingestion	Quant	Due to the depth to groundwater (approximately 16-20 ft bgs), the receptor is not likely to ingest groundwater during excavation activities.
						Dermal Absorption	Quant	Due to the depth to groundwater (approximately 16-20 ft bgs), the receptor is not likely to contact groundwater during excavation activities.
				Resident	Adult	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply.
					Child	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to groundwater. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Upward Migration of Vapors from Groundwater (Outdoors)[2]	Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air.[2]
				Construction Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air.
				Resident	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.[2]
					Child	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.[2]
			Upward Migration of Vapors from Groundwater (Indoors)[2]	Commercial/Industrial Worker	Adult	Inhalation	None	Receptor not likely inhale VOCs from groundwater via vapor intrusion into building.[2]
				Construction Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Resident	Adult	Inhalation	None	Receptor not likely inhale VOCs from groundwater via vapor intrusion into residence.[2]
					Child	Inhalation	None	Receptor not likely to inhale VOCs from groundwater via vapor intrusion into residence.[2]
			Vapors while Showering[2]	Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
				Resident	Adult	Inhalation	None	Receptor is not likely inhale vapors from groundwater while showering.[2]
					Child	Inhalation	None	Receptor is assumed not to shower.

Notes:
[1] Groundwater from the surface aquifer is not currently used at the sites for potable or non-potable water supply.
[2] VOCs are not chemicals of interest for the site; therefore, the vapors pathway is not assessed quantitatively.

Table E.1-2.1
Area A COPC Determination - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Surface Soil		**TAL Metals**														
	7429-90-5	Aluminum	6,620	19,400	mg/kg	54SB23A (C)	25/25	2.4 - 6.8	19,400	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.04	0.76	mg/kg	54SB34A (D)	13/22	0.0386 - 0.43	0.76	3.13	N	40.88	N	IND	N	BSL
	7440-38-2	Arsenic	0.67	2.5	mg/kg	54SB31A	25/25	0.058 - 0.36	2.5	0.426	C	1.91	C	IND	Y	***ARES/IND***
	7440-39-3	Barium	84.9	206	mg/kg	54SB38A (D)	25/25	0.02 - 0.103	206	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.21	1	mg/kg	54SB38A (D)	25/25	0.01 - 0.0267	1	15.6	N	204	N	IND	N	BSL
	7440-43-9	Cadmium	0.1	1.6	mg/kg	54SB57A (E)	6/25	0.03 - 0.25	2	7.8	N	102.2	N	IND	N	BSL
	7440-70-2	Calcium	1,020	21,500	mg/kg	54SB21A	25/25	1 - 17.5	21,500	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium [1]	12	29.5	mg/kg	54SB31A	25/25	0.07 - 0.998	29.5	23.5	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	5.8	16	mg/kg	54SB57A (E)	25/25	0.07 - 0.233	16	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	3.9	84.1	mg/kg	54SB34A (D)	25/25	0.15 - 0.516	84.1	313	N	4,088	N	IND	N	BSL
	7439-89-6	Iron	13,700	27,200	mg/kg	54SB25A	25/25	0.731 - 1.7	27,200	5,475	N	71,540	N	IND	Y	**ARES**
	7439-92-1	Lead [2]	6.4	528	mg/kg	54SB34A (D)	26/26	0.041 - 0.776	528	400	--	750	--	AL	Y	**ARES**
	7439-95-4	Magnesium	1,880	5,000	mg/kg	54SB57A (E)	25/25	0.66 - 7.67	5,000	--	--	156,400	--	RDA	N	BSL
	7439-96-5	Manganese	309	909	mg/kg	54SB38A (D)	25/25	0.02 - 0.474	909	156	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury [3]	0.017	0.31	mg/kg	54SB33A (B)	25/25	0.0077 - 0.021	0.31	2.3	N	31	N	IND	N	BSL
	7440-02-0	Nickel	8.4	13.5	mg/kg	54SB32A	25/25	0.0775 - 0.13	13.5	156	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	832	1,810	mg/kg	54SB57A (E)	25/25	4.3 - 14.9	1,810	--	--	2,607,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.057	2	mg/kg	54SB38A (D)	23/25	0.0486 - 0.41	2	39.1	N	511	N	IND	N	BSL
	7440-22-4	Silver	0.049	0.09	mg/kg	54SB57A (E)	3/25	0.0178 - 0.1	0.09	39.1	N	511	N	IND	N	BSL
	7440-23-5	Sodium	38	469	mg/kg	54SB38A (D)	21/25	27.1 - 36.4	469	--	--	625,700	--	RDA	N	BSL
	7440-28-0	Thallium	0.120	0.2	mg/kg	54SB57A (E)	3/15	0.0733 - 0.64	0.2	0.548	N	7.15	N	IND	N	BSL
	7440-62-2	Vanadium	16	55.3	mg/kg	54SB23A (C)	25/25	0.07 - 0.401	55.3	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	43.2	337	mg/kg	54SB34A (D)	25/25	0.11 - 0.789	337	2,346	N	30,660	N	IND	N	BSL
		TCL Pesticides/PCBs														
	72-55-9	4,4'-DDE	4.8E-03	4.8E-03	mg/kg	54SB57A (E)	1/14	0.0004 - 0.00335	4.8E-03	1.9E+00	C	8.4E+00	C	IND	N	BSL
	50-29-3	4,4'-DDT	2.1E-03	2.6E-02	mg/kg	54SB57A (E)	3/14	0.00039 - 0.00312	2.6E-02	1.9E+00	C	8.4E+00	C	IND	N	BSL
	5103-71-9	alpha-Chlordane [4]	3.1E-03	3.1E-03	mg/kg	54SB57A (E)	1/14	0.00022 - 0.0026	3.1E-03	1.8E+00	C	8.2E+00	C	IND	N	BSL
	319-86-8	delta-BHC [5]	5.0E-04	5.0E-04	mg/kg	54SB30A	1/14	0.00015 - 0.00226	5.0E-04	1.0E-01	C	4.5E-01	C	IND	N	BSL
	1031-07-8	Endosulfan Sulfate [6]	1.8E-03	1.8E-03	mg/kg	54SB25A	1/14	0.0004 - 0.00311	1.8E-03	4.7E+01	N	6.1E+02	N	IND	N	BSL
	7421-93-4	Endrin aldehyde [7]	1.2E-03	1.2E-03	mg/kg	54SB30A	1/14	0.00035 - 0.00252	1.2E-03	2.3E+00	N	3.1E+01	N	IND	N	BSL
	58-89-9	gamma-BHC (Lindane)	1.6E-03	1.6E-03	mg/kg	54SB30A	1/14	0.00022 - 0.00304	1.6E-03	4.9E-01	C	2.2E+00	C	IND	N	BSL
	5103-74-2	gamma-Chlordane [4]	1.0E-02	1.0E-02	mg/kg	54SB57A (E)	1/14	0.00035 - 0.00265	1.0E-02	1.8E+00	C	8.2E+00	C	IND	N	BSL
	76-44-8	Heptachlor	1.1E-03	4.8E-03	mg/kg	54SB30A	2/14	0.00034 - 0.00285	4.8E-03	1.4E-01	C	6.4E-01	C	IND	N	BSL
	1024-57-3	Heptachlor epoxide	1.1E-01	1.1E-01	mg/kg	54SB32A	1/14	0.00026 - 0.00401	1.1E-01	7.0E-02	C	3.1E-01	C	IND	Y	**ARES**
	72-43-5	Methoxychlor	6.3E-03	7.4E-03	mg/kg	54SB30A	2/14	0.0014 - 0.00541	7.4E-03	3.9E+01	N	5.1E+02	N	IND	N	BSL
	11097-69-1	Aroclor 1254 [8]	2.8E-02	2.0E-01	mg/kg	54SB57A (E)	3/14	0.0068 - 0.009	2.0E-01	1.6E-01	N	1.4E+00	C	IND	Y	**ARES**
	11096-82-5	Aroclor 1260	7.8E-02	7.8E-02	mg/kg	54SB3A	1/14	0.005 - 0.0111	7.8E-02	3.2E-01	C	1.4E+00	C	IND	N	BSL
		TCL SVOCs														
	88-74-4	2-Nitroaniline	5.5E-02	5.5E-02	mg/kg	54SB27A (D)	1/18	0.029 - 0.029	5.5E-02	--	--	--	--	--	Y	NSV
	117-81-7	Bis(2-ethylhexyl)phthalate	6.1E-02	2.6E+00	mg/kg	54SB27A (D)	13/18	0.032 - 0.032	2.6E+00	4.6E+01	C	2.0E+02	C	IND	N	BSL
	84-74-2	Di-n-butylphthalate	4.9E-02	8.0E-01	mg/kg	54SB27A (D)	6/18	0.38 - 0.42	8.0E-01	7.8E+02	N	1.0E+04	N	IND	N	BSL
	117-84-0	Di-n-octylphthalate	5.7E-02	3.2E-01	mg/kg	54SB28A	7/18	0.38 - 0.42	3.2E-01	--	--	--	--	--	Y	NSV
	84-66-2	Diethylphthalate	1.2E-01	6.8E-01	mg/kg	54SB32A	5/18	0.38 - 0.42	6.8E-01	6.3E+03	N	8.2E+04	N	IND	N	BSL
	86-30-6	N-Nitrosodiphenylamine	6.6E-02	1.2E+00	mg/kg	54SB27A (D)	3/18	0.38 - 0.42	1.2E+00	1.3E+02	C	5.8E+02	C	IND	N	BSL
		Dioxin/Furans														
	--	Total 2,3,7,8-TCDD Equivalents	3.8E-08	1.7E-05	mg/kg	54SB33A (B)	9/9	--	1.7E-05	4.3E-06	C	1.9E-05	C	IND	Y	**ARES**
		PAHs														
	83-32-9	Acenaphthene	3.3E-02	1.6E+00	mg/kg	54SB27A (D)	9/13	0.0058 - 0.051	1.6E+00	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene [9]	2.2E-02	1.1E+00	mg/kg	54SB27A (D)	5/18	0.0059 - 0.051	1.1E+00	2.3E+02	N	3.1E+03	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	3.6E-03	4.9E-02	mg/kg	54SB30A	12/18	0.0022 - 0.01	4.9E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	50-32-8	Benzo(a)pyrene	3.4E-03	5.8E-02	mg/kg	54SB25A	7/18	0.0016 - 0.01	5.8E-02	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	205-99-2	Benzo(b)fluoranthene	5.2E-03	1.1E-01	mg/kg	54SB27A (D)	9/18	0.0017 - 0.01	1.1E-01	2.2E-01	C	3.9E+00	C	IND	N	BSL
	191-24-2	Benzo(g,h,i)perylene [9]	1.1E-02	3.2E-02	mg/kg	54SB24A	4/18	0.0036 - 0.01	3.2E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	3.7E-03	5.7E-02	mg/kg	54SB25A	8/18	0.0014 - 0.01	5.7E-02	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	4.5E-03	2.1E-01	mg/kg	54SB33A (B)	10/18	0.0024 - 0.01	2.1E-01	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	1.6E-02	3.6E-02	mg/kg	54SB24A	4/18	0.0042 - 0.01	3.6E-02	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	206-44-0	Fluoranthene	4.8E-03	9.0E-02	mg/kg	54SB25A	15/18	0.0021 - 0.02	9.0E-02	3.1E+02	N	4.1E+03	N	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	1.4E-02	3.9E-01	mg/kg	54SB33A (B)	5/18	0.0025 - 0.01	3.9E-01	2.2E-01	C	3.9E+00	C	IND	Y	**ARES**
	91-20-3	Naphthalene	4.6E-02	9.4E+00	mg/kg	54SB30A	9/12	0.014 - 0.049	9.4E+00	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene [9]	1.9E-02	1.2E-01	mg/kg	54SB30A	5/18	0.0085 - 0.051	1.2E-01	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	1.3E-02	1.8E-01	mg/kg	54SB27A (D)	13/18	0.0043 - 0.02	1.8E-01	2.3E+02	N	3.1E+03	N	IND	N	BSL

Table E.1-2.1
Area A COPC Determination - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
		Explosives														
	99-35-4	1,3,5-Trinitrobenzene	7.6E+00	7.6E+00	mg/kg	54SB27A (D)	1/17	0.079 - 0.246	7.6E+00	2.3E+02	N	3.1E+03	N	IND	N	BSL
	118-96-7	2,4,6-Trinitrotoluene[10]	4.3E-01	1.3E+02	mg/kg	54SB27A (D)	4/29	0.051 - 0.16	1.3E+02	3.9E+00	N	5.1E+01	N	IND	Y	***ARES/IND***
	121-14-2	2,4-Dinitrotoluene	1.7E+01	1.7E+01	mg/kg	54SB27A (D)	1/29	0.073 - 0.12	1.7E+01	1.6E+01	N	2.0E+02	N	IND	Y	**ARES**
	606-20-2	2,6-Dinitrotoluene	1.1E+01	1.1E+01	mg/kg	54SB27A (D)	1/29	0.099 - 0.19	1.1E+01	7.8E+00	N	1.0E+02	N	IND	Y	**ARES**
	--	Dinitrotoluene Mix	2.8E+01	2.8E+01	mg/kg	54SB27A (D)	1/29	--	2.8E+01	9.4E-01	--	4.2E+00	--	IND	Y	***ARES/IND***
	35572-78-2	2-Amino-4,6-Dinitrotoluene	1.7E-01	5.7E+00	mg/kg	54SB27A (D)	3/29	0.088 - 0.106	5.7E+00	1.6E+01	N	2.0E+02	N	IND	N	BSL
	1946-51-0	4-Amino-2,6-Dinitrotoluene	7.6E-01	5.2E+00	mg/kg	54SB27A (D)	2/29	0.053 - 0.095	5.2E+00	1.6E+01	N	2.0E+02	N	IND	N	BSL
	--	Aminodinitrotoluenes	2.0E-01	1.1E+01	mg/kg	54SB27A (D)	3/29	--	1.1E+01	1.6E+01	N	2.0E+02	N	IND	N	BSL
	2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	6.8E+00	6.8E+00	mg/kg	54SB27A (D)	1/29	0.1 - 0.208	6.8E+00	3.9E+02	N	5.1E+03	N	IND	N	BSL

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
N/C = Noncarcinogenic/Carcinogenic per EPA RBC Table (October 2007)
[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Chlordane RBC value was used
[5] = Alpha-BHC RBC value was used
[6] = Endosulfan RBC value was used
[7] = Endrin RBC value was used
[8] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[9] = Pyrene RBC value was used
[10] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

(A) = Facility-Wide Background Point Estimate as Reported in the Facility-Wide Background Study Report (IT 2001a)
(B) = Re-sampled; Pesticides and PCBs analyzed January 2007.
(C) = Re-sampled; Pesticides, PCBs, and Dioxin/Furans analyzed January 2007.
(D) = Re-sampled; Dioxin/Furans analyzed January 2007.
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ARAR = Applicable, Relevant, and Appropriate Requirement
USEPA = U.S. Environmental Protection Agency
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RDA = Recommended Daily Allowance
IND = Adjusted Industrial RBC
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ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

Table E.1-2.2
Area A COPC Determination - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Total Soil
Exposure Medium:	Total Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Total Soil		**TAL Metals**														
	7429-90-5	Aluminum	5,550	19,400	mg/kg	54SB23A (C)	50/50	2.3 - 7.1	19,400	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.04	4.8	mg/kg	54SB33B	25/43	0.0386 - 0.46	4.8	3.13	N	40.88	N	IND	Y	**ARES**
	7440-38-2	Arsenic	0.29	2.5	mg/kg	54SB31A	49/50	0.058 - 0.37	2.5	0.426	C	1.91	C	IND	Y	***ARES/IND***
	7440-39-3	Barium	57.5	206	mg/kg	54SB38A (D)	50/50	0.02 - 0.103	206	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.21	1.1	mg/kg	54SB17B	50/50	0.01 - 0.0267	1.1	15.6	N	204.4	N	IND	N	BSL
	7440-43-9	Cadmium	0.1	1.6	mg/kg	54SB57A (E)	9/50	0.03 - 0.25	1.6	7.8	N	102.2	N	IND	N	BSL
	7440-70-2	Calcium	666	21,500	mg/kg	54SB21A	50/50	1 - 17.5	21,500	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium [1]	9.7	29.5	mg/kg	54SB31A	50/50	0.06 - 0.998	29.5	23.5	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	4.7	16	mg/kg	54SB57A (E)	50/50	0.06 - 0.233	16	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	2	84.1	mg/kg	54SB34A (D)	50/50	0.15 - 0.516	84.1	313	N	4,088	N	IND	N	BSL
	7439-89-6	Iron	10,100	27,200	mg/kg	54SB25A	50/50	0.731 - 1.7	27,200	5,475	N	71,540	N	IND	Y	**ARES**
	7439-92-1	Lead [2]	4.4	528	mg/kg	54SB34A (D)	52/52	0.041 - 0.776	528	400	--	750	--	AL	Y	**ARES**
	7439-95-4	Magnesium	1,760	7,465	mg/kg	54SB31B DUP AVG	50/50	0.64 - 7.67	7,465	--	--	156,400	--	RDA	N	BSL
	7439-96-5	Manganese	220	909	mg/kg	54SB38A (D)	50/50	0.02 - 0.474	909	156	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury [3]	0.012	0.54	mg/kg	54SB25B	48/50	0.0077 - 0.021	0.54	2.3	N	31	N	IND	N	BSL
	7440-02-0	Nickel	6.2	16	mg/kg	54SB17B	50/50	0.0775 - 0.13	16	156.4	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	819	1,810	mg/kg	54SB57A (E)	50/50	4.3 - 14.9	1,810	--	--	2,607,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.057	2	mg/kg	54SB38A (D)	46/50	0.0486 - 0.41	2	39.1	N	511	N	IND	N	BSL
	7440-22-4	Silver	0.047	0.089	mg/kg	54SB57A (E)	6/50	0.0178 - 0.1	0.089	39.1	N	511	N	IND	N	BSL
	7440-23-5	Sodium	32	525	mg/kg	54SB33B	46/50	25.9 - 38	525	--	--	625,700	--	RDA	N	BSL
	7440-28-0	Thallium	0.1	0.2	mg/kg	54SB57A (E)	6/31	0.0733 - 0.64	0.2	0.548	N	7.154	N	IND	N	BSL
	7440-62-2	Vanadium	14.6	55.3	mg/kg	54SB23A (C)	50/50	0.07 - 0.401	55.3	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	30.1	337	mg/kg	54SB34A (D)	50/50	0.1 - 0.789	337	2,346	N	30,660	N	IND	N	BSL
		TCL Pesticides/PCBs														
	72-55-9	4,4'-DDE	4.8E-03	4.8E-03	mg/kg	54SB57A (E)	1/31	0.0004 - 0.00346	4.8E-03	1.9E+00	C	8.4E+00	C	IND	N	BSL
	50-29-3	4,4'-DDT	2.1E-03	2.6E-02	mg/kg	54SB57A (E)	5/31	0.00039 - 0.00323	2.6E-02	1.9E+00	C	8.4E+00	C	IND	N	BSL
	5103-71-9	alpha-Chlordane [4]	3.1E-03	3.1E-03	mg/kg	54SB57A (E)	1/31	0.00022 - 0.00269	3.1E-03	1.8E+00	C	8.2E+00	C	IND	N	BSL
	319-86-8	delta-BHC [5]	4.6E-04	5.0E-04	mg/kg	54SB30A	2/31	0.00015 - 0.00237	5.0E-04	1.0E-01	C	4.5E-01	C	IND	N	BSL
	1031-07-8	Endosulfan Sulfate [6]	1.8E-03	1.8E-03	mg/kg	54SB25A	1/31	0.0004 - 0.00322	1.8E-03	4.7E+01	N	6.1E+02	N	IND	N	BSL
	7421-93-4	Endrin aldehyde [7]	1.2E-03	2.6E-02	mg/kg	54SB25B	3/31	0.00035 - 0.00388	2.6E-02	2.3E+00	N	3.1E+01	N	IND	N	BSL
	58-89-9	gamma-BHC (Lindane)	1.6E-03	1.6E-03	mg/kg	54SB30A	1/31	0.00022 - 0.00314	1.6E-03	4.9E-01	C	2.2E+00	C	IND	N	BSL
	5103-74-2	gamma-Chlordane [4]	1.0E-02	1.3E-02	mg/kg	54SB25B	2/31	0.00035 - 0.00274	1.3E-02	1.8E+00	C	8.2E+00	C	IND	N	BSL
	76-44-8	Heptachlor	1.1E-03	4.8E-03	mg/kg	54SB30A	2/31	0.00034 - 0.00295	4.8E-03	1.4E-01	C	6.4E-01	C	IND	N	BSL
	1024-57-3	Heptachlor epoxide	1.9E-03	2.9E-01	mg/kg	54SB25B	5/31	0.00026 - 0.00415	2.9E-01	7.0E-02	C	3.1E-01	C	IND	Y	**ARES**
	72-43-5	Methoxychlor	6.3E-03	7.4E-03	mg/kg	54SB30A	2/31	0.0014 - 0.0056	7.4E-03	3.9E+01	N	5.1E+02	N	IND	N	BSL
	11097-69-1	Aroclor 1254 [8]	2.8E-02	2.0E-01	mg/kg	54SB57A (E)	3/31	0.0068 - 0.009	2.0E-01	1.6E-01	N	1.4E+00	C	IND	Y	**ARES**
	11096-82-5	Aroclor 1260	7.8E-02	7.8E-02	mg/kg	54SB3A	1/31	0.005 - 0.0121	7.8E-02	3.2E-01	C	1.4E+00	C	IND	N	BSL
		TCL SVOCs														
	88-74-4	2-Nitroaniline	5.5E-02	5.5E-02	mg/kg	54SB27A (D)	1/36	0.029 - 0.029	5.5E-02	--	--	--	--	--	Y	NSV
	117-81-7	Bis(2-ethylhexyl)phthalate	3.0E-02	2.6E+00	mg/kg	54SB27A (D)	25/36	0.032 - 0.032	2.6E+00	4.6E+01	C	2.0E+02	C	IND	N	BSL
	84-74-2	Di-n-butylphthalate	3.7E-02	8.0E-01	mg/kg	54SB27A (D)	10/36	0.38 - 0.42	8.0E-01	7.8E+02	N	1.0E+04	N	IND	N	BSL
	117-84-0	Di-n-octylphthalate	3.1E-02	3.9E-01	mg/kg	54SB31B DUP AVG	12/36	0.38 - 0.42	3.9E-01	--	--	--	--	--	Y	NSV
	84-66-2	Diethylphthalate	1.2E-01	6.8E-01	mg/kg	54SB32A	8/36	0.38 - 0.42	6.8E-01	6.3E+03	N	8.2E+04	N	IND	N	BSL
	86-30-6	N-Nitrosodiphenylamine	6.6E-02	1.2E+00	mg/kg	54SB27A (D)	6/36	0.38 - 0.42	1.2E+00	1.3E+02	C	5.8E+02	C	IND	N	BSL
		Dioxin/Furans														
	--	Total 2,3,7,8-TCDD Equivalents	2.9E-08	1.7E-05	mg/kg	54SB33A (B)	23/23	--	1.7E-05	4.3E-06	C	1.9E-05	C	IND	Y	**ARES**
		PAHs														
	83-32-9	Acenaphthene	2.7E-02	8.6E+00	mg/kg	54SB31B DUP AVG	17/26	0.0058 - 0.053	8.6E+00	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene [9]	1.0E-02	1.1E+00	mg/kg	54SB27A (D)	10/36	0.0059 - 0.053	1.1E+00	2.3E+02	N	3.1E+03	N	IND	N	BSL
	120-12-7	Anthracene	1.5E-02	8.9E-02	mg/kg	54SB31B DUP AVG	2/36	0.0054 - 0.053	8.9E-02	2.3E+03	N	3.1E+04	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	3.6E-03	3.5E-01	mg/kg	54SB31B DUP AVG	17/36	0.0022 - 0.01	3.5E-01	2.2E-01	C	3.9E+00	C	IND	Y	**ARES**
	50-32-8	Benzo(a)pyrene	2.0E-03	6.8E-01	mg/kg	54SB31B DUP AVG	13/36	0.0016 - 0.01	6.8E-01	2.2E-02	C	3.9E-01	C	IND	Y	***ARES/IND***
	205-99-2	Benzo(b)fluoranthene	4.9E-03	7.3E-01	mg/kg	54SB31B DUP AVG	15/36	0.0017 - 0.01	7.3E-01	2.2E-01	C	3.9E+00	C	IND	Y	**ARES**
	191-24-2	Benzo(g,h,i)perylene [9]	1.1E-02	5.2E-01	mg/kg	54SB31B DUP AVG	6/36	0.0036 - 0.01	5.2E-01	2.3E+02	N	3.1E+03	N	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	3.7E-03	1.0E+00	mg/kg	54SB31B DUP AVG	14/36	0.0014 - 0.01	1.0E+00	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	4.5E-03	4.1E-01	mg/kg	54SB31B DUP AVG	15/36	0.0024 - 0.01	4.1E-01	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	1.6E-02	6.8E-01	mg/kg	54SB31B DUP AVG	6/36	0.0042 - 0.01	6.8E-01	2.2E-02	C	3.9E-01	C	IND	Y	***ARES/IND***
	206-44-0	Fluoranthene	4.8E-03	1.1E+00	mg/kg	54SB31B DUP AVG	27/36	0.0021 - 0.022	1.1E+00	3.1E+02	N	4.1E+03	N	IND	N	BSL
	86-73-7	Fluorene	2.6E-02	2.6E-02	mg/kg	54SB20B	1/20	0.014 - 0.014	2.6E-02	3.1E+02	N	4.1E+03	N	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	5.9E-03	5.2E-01	mg/kg	54SB31B DUP AVG	7/36	0.0025 - 0.01	5.2E-01	2.2E-01	C	3.9E+00	C	IND	Y	**ARES**
	91-20-3	Naphthalene	2.3E-02	9.4E+00	mg/kg	54SB30A	16/23	0.014 - 0.049	9.4E+00	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene [9]	1.1E-02	2.4E-01	mg/kg	54SB31B DUP AVG	7/36	0.0085 - 0.053	2.4E-01	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	8.1E-03	1.2E+00	mg/kg	54SB31B DUP AVG	25/36	0.0043 - 0.022	1.2E+00	2.3E+02	N	3.1E+03	N	IND	N	BSL

Table E.1-2.2
Area A COPC Determination - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Total Soil
Exposure Medium:	Total Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
		Explosives														
	99-35-4	1,3,5-Trinitrobenzene	1.8E+00	7.6E+00	mg/kg	54SB27A (D)	2/35	0.079 - 0.246	7.6E+00	2.3E+02	N	3.1E+03	N	IND	N	BSL
	118-96-7	2,4,6-Trinitrotoluene[10]	4.3E-01	1.3E+02	mg/kg	54SB27A (D)	8/60	0.051 - 0.16	1.3E+02	3.9E+00	N	5.1E+01	N	IND	Y	***ARES/IND***
	121-14-2	2,4-Dinitrotoluene	4.0E-01	1.7E+01	mg/kg	54SB27A (D)	3/60	0.073 - 0.12	1.7E+01	1.6E+01	N	2.0E+02	N	IND	Y	**ARES**
	606-20-2	2,6-Dinitrotoluene	1.1E+00	1.1E+01	mg/kg	54SB27A (D)	2/60	0.099 - 0.19	1.1E+01	7.8E+00	N	1.0E+02	N	IND	Y	**ARES**
	--	Dinitrotoluene Mix	5.0E-01	2.8E+01	mg/kg	54SB27A (D)	3/60	--	2.8E+01	9.4E-01	--	4.2E+00	--	IND	Y	***ARES/IND***
	35572-78-2	2-Amino-4,6-Dinitrotoluene	1.7E-01	5.7E+00	mg/kg	54SB27A (D)	7/60	0.088 - 1	5.7E+00	1.6E+01	N	2.0E+02	N	IND	N	BSL
	1946-51-0	4-Amino-2,6-Dinitrotoluene	3.8E-01	5.2E+00	mg/kg	54SB27A (D)	6/60	0.053 - 0.095	5.2E+00	1.6E+01	N	2.0E+02	N	IND	N	BSL
	--	Aminodinitrotoluenes	2.0E-01	1.1E+01	mg/kg	54SB27A (D)	7/60	--	1.1E+01	1.6E+01	N	2.0E+02	N	IND	N	BSL
	2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	6.8E+00	6.8E+00	mg/kg	54SB27A (D)	1/60	0.1 - 0.208	6.8E+00	3.9E+02	N	5.1E+03	N	IND	N	BSL
		Nitroglycerin							0.0E+00							
	55-63-0	Nitroglycerin	3.2E+01	3.2E+01	mg/kg	54SB32B	1/50	1 - 1.45	3.2E+01	7.8E-01	N	1.0E+01	N	IND	Y	***ARES/IND***

Notes:

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TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RBC = USEPA Region III Risk-Based Concentration
(RBC) values from the October 11, 2007,
RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
N/C = Noncarcinogenic/Carcinogenic per EPA RBC Table (October 2007)
[1] = Chromium VI RBC value was used
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[3] = Mercuric chloride soil RBC value used
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(A) = Facility-Wide Background Point Estimate as Reported in the Facility-Wide Background Study Report (IT 2001a)
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(E) = Re-sampled; PCBs and PCB Congeners analyzed January 2007.

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ARAR = Applicable, Relevant, and Appropriate Requirement
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ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

Table E.1-2.3
Non-detected Chemical MDL Screening for Area A - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
TAL Metals							
ANTIMONY	7440-36-0	mg/kg	45	0.0386	0.46	3.13	N
ARSENIC	7440-38-2	mg/kg	1	0.26	0.26	0.426	N
CADMIUM	7440-43-9	mg/kg	41	0.03	0.05	7.82	N
MERCURY [1]	7439-97-6	mg/kg	9	0.0077	0.019	--	--
SELENIUM	7782-49-2	mg/kg	20	0.0486	0.0486	39.11	N
SILVER	7440-22-4	mg/kg	44	0.07	0.1	39.11	N
SODIUM	7440-23-5	mg/kg	22	31.4	34.3	--	--
THALLIUM	7440-28-0	mg/kg	46	0.0733	0.64	0.548	**Y**
Pesticides/PCBs							
4,4'-DDD	72-54-8	ug/kg	75	0.32	3.44	2.7E+03	N
4,4'-DDE	72-55-9	ug/kg	74	0.4	4.15	1.9E+03	N
4,4'-DDT	50-29-3	ug/kg	70	0.39	3.87	1.9E+03	N
ALDRIN	309-00-2	ug/kg	75	0.17	3.24	3.8E+01	N
ALPHA-BHC	319-84-6	ug/kg	75	0.26	3.64	1.0E+02	N
ALPHA-CHLORDANE [2]	5103-71-9	ug/kg	74	0.22	3.23	1.8E+03	N
BETA-BHC	319-85-7	ug/kg	75	0.28	4.51	3.5E+02	N
DELTA-BHC [3]	319-86-8	ug/kg	73	0.15	2.8	1.0E+02	N
DIELDRIN	60-57-1	ug/kg	75	0.43	3.39	4.0E+01	N
ENDOSULFAN I	959-98-8	ug/kg	75	0.43	3.77	4.7E+04	N
ENDOSULFAN II	33213-65-9	ug/kg	75	0.58	2.27	4.7E+04	N
ENDOSULFAN SULFATE [4]	1031-07-8	ug/kg	74	0.4	3.87	4.7E+04	N
ENDRIN	72-20-8	ug/kg	75	0.35	3.81	2.3E+03	N
ENDRIN ALDEHYDE [5]	7421-93-4	ug/kg	72	0.35	4.55	2.3E+03	N
ENDRIN KETONE [5]	53494-70-5	ug/kg	75	0.39	4.45	2.3E+03	N
GAMMA-BHC (LINDANE)	58-89-9	ug/kg	74	0.22	3.77	4.9E+02	N
GAMMA-CHLORDANE [2]	5103-74-2	ug/kg	73	0.35	3.29	1.8E+03	N
HEPTACHLOR	76-44-8	ug/kg	73	0.34	3.54	1.4E+02	N
HEPTACHLOR EPOXIDE	1024-57-3	ug/kg	70	0.26	4.98	7.0E+01	N
METHOXYCHLOR	72-43-5	ug/kg	73	1.4	6.72	3.9E+04	N
TOXAPHENE	8001-35-2	ug/kg	75	18	98.6	5.8E+02	N
AROCLOR 1016	12674-11-2	ug/kg	75	4.8	55	5.5E+02	N
AROCLOR 1221	11104-28-2	ug/kg	75	10.3	16	3.2E+02	N
AROCLOR 1232	11141-16-5	ug/kg	75	5.1	11.6	3.2E+02	N
AROCLOR 1242	53469-21-9	ug/kg	75	6.16	10	3.2E+02	N
AROCLOR 1248	12672-29-6	ug/kg	75	4.2	9.1	3.2E+02	N
AROCLOR 1254 [6]	11097-69-1	ug/kg	67	6.8	9.52	1.6E+02	N
AROCLOR 1260	11096-82-5	ug/kg	74	5	14.1	3.2E+02	N
TCL SVOCs							
1,1'-BIPHENYL	92-52-4	ug/kg	36	22	22	3.9E+05	N
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	ug/kg	36	30	30	9.1E+03	N
2,4,5-TRICHLOROPHENOL	95-95-4	ug/kg	36	49	49	7.8E+05	N
2,4,6-TRICHLOROPHENOL	88-06-2	ug/kg	36	50	50	7.8E+03	N
2,4-DICHLOROPHENOL	120-83-2	ug/kg	36	22	22	2.3E+04	N
2,4-DIMETHYLPHENOL	105-67-9	ug/kg	36	30	30	1.6E+05	N
2,4-DINITROPHENOL	51-28-5	ug/kg	36	170	170	1.6E+04	N
2,4-DINITROTOLUENE	121-14-2	ug/kg	33	20	20	1.6E+04	N
2,6-DINITROTOLUENE	606-20-2	ug/kg	34	21	21	7.8E+03	N
2-CHLORONAPHTHALENE	91-58-7	ug/kg	36	22	22	6.3E+05	N
2-CHLOROPHENOL	95-57-8	ug/kg	36	18	18	3.9E+04	N
2-METHYLNAPHTHALENE	91-57-6	ug/kg	36	24	24	3.1E+04	N
2-METHYLPHENOL	95-48-7	ug/kg	36	27	27	3.9E+05	N
2-NITROANILINE	88-74-4	ug/kg	35	29	29	--	--
2-NITROPHENOL	88-75-5	ug/kg	36	26	26	--	--
3,3'-DICHLOROBENZIDINE	91-94-1	ug/kg	36	29	29	1.4E+03	N
3-NITROANILINE	99-09-2	ug/kg	36	34	34	--	--
4,6-DINITRO-2-METHYLPHENOL	534-52-1	ug/kg	36	35	35	--	--
4-BROMOPHENYL PHENYL ETHER	101-55-3	ug/kg	36	380	420	--	--
4-CHLORO-3-METHYLPHENOL	59-50-7	ug/kg	36	29	29	--	--
4-CHLOROANILINE	106-47-8	ug/kg	36	16	16	3.1E+04	N
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	ug/kg	36	380	420	--	--
4-METHYLPHENOL	106-44-5	ug/kg	36	48	48	3.9E+04	N
4-NITROANILINE	100-01-6	ug/kg	36	39	39	--	--
4-NITROPHENOL	100-02-7	ug/kg	36	75	75	--	--
ACENAPHTHENE	83-32-9	ug/kg	36	31	31	4.7E+05	N
ACENAPHTHYLENE [7]	208-96-8	ug/kg	35	17	17	2.3E+05	N
ACETOPHENONE	98-86-2	ug/kg	36	23	23	7.8E+05	N
ANTHRACENE	120-12-7	ug/kg	35	25	25	2.3E+06	N
ATRAZINE	1912-24-9	ug/kg	36	16	16	2.9E+03	N
BENZALDEHYDE	100-52-7	ug/kg	36	39	39	7.8E+05	N
BENZO(A)ANTHRACENE	56-55-3	ug/kg	34	29	29	2.2E+02	N
BENZO(A)PYRENE	50-32-8	ug/kg	34	23	23	2.2E+01	**Y**

Table E.1-2.3
Non-detected Chemical MDL Screening for Area A - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
BENZO(B)FLUORANTHENE	205-99-2	ug/kg	35	36	36	2.2E+02	N
BENZO(G,H,I)PERYLENE [7]	191-24-2	ug/kg	34	23	23	2.3E+05	N
BENZO(K)FLUORANTHENE	207-08-9	ug/kg	34	29	29	2.2E+03	N
BIS(2-CHLOROETHOXY)METHANE	111-91-1	ug/kg	36	21	21	--	--
BIS(2-CHLOROETHYL)ETHER	111-44-4	ug/kg	36	18	18	5.8E+02	N
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	ug/kg	11	32	32	4.6E+04	N
BUTYL BENZYL PHTHALATE	85-68-7	ug/kg	36	380	420	1.6E+06	N
CAPROLACTAM	105-60-2	ug/kg	36	62	62	3.9E+06	N
CARBAZOLE	86-74-8	ug/kg	36	29	29	3.2E+04	N
CHRYSENE	218-01-9	ug/kg	34	28	28	2.2E+04	N
DI-N-BUTYL PHTHALATE	84-74-2	ug/kg	26	380	420	7.8E+05	N
DI-N-OCTYL PHTHALATE	117-84-0	ug/kg	24	380	420	--	--
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/kg	35	21	21	2.2E+01	N
DIBENZOFURAN	132-64-9	ug/kg	36	24	24	7.8E+03	N
DIETHYL PHTHALATE	84-66-2	ug/kg	28	390	420	6.3E+06	N
DIMETHYL PHTHALATE	131-11-3	ug/kg	36	380	420	--	--
FLUORANTHENE	206-44-0	ug/kg	29	18	18	3.1E+05	N
FLUORENE	86-73-7	ug/kg	36	18	18	3.1E+05	N
HEXACHLOROBENZENE	118-74-1	ug/kg	36	22	22	4.0E+02	N
HEXACHLOROBUTADIENE	87-68-3	ug/kg	36	24	24	7.8E+03	N
HEXACHLOROCYCLOPENTADIENE	77-47-4	ug/kg	36	67	67	4.7E+04	N
HEXACHLOROETHANE	67-72-1	ug/kg	36	17	17	7.8E+03	N
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/kg	34	20	20	2.2E+02	N
ISOPHORONE	78-59-1	ug/kg	36	28	28	6.7E+05	N
NAPHTHALENE	91-20-3	ug/kg	36	21	21	1.6E+05	N
N-NITROSO-DI-N-PROPYLAMINE	621-64-7	ug/kg	36	21	21	9.1E+01	N
N-NITROSODIPHENYLAMINE	86-30-6	ug/kg	30	380	420	1.3E+05	N
NITROBENZENE	98-95-3	ug/kg	35	28	28	3.9E+03	N
PENTACHLOROPHENOL	87-86-5	ug/kg	36	46	46	5.3E+03	N
PHENANTHRENE [7]	85-01-8	ug/kg	35	24	24	2.3E+05	N
PHENOL	108-95-2	ug/kg	36	34	34	2.3E+06	N
PYRENE	129-00-0	ug/kg	32	24	24	2.3E+05	N
Dioxin/Furans							
1,2,3,4,6,7,8,9-OCDF (OCDF)	39001-02-0	pg/g	17	0.8	1.73	--	--
1,2,3,4,6,7,8-HpCDF	67562-39-4	pg/g	9	0.3	0.517	--	--
1,2,3,4,7,8,9-HpCDF	55673-89-7	pg/g	24	0.4	0.7	--	--
1,2,3,4,7,8-HxCDD	39227-28-6	pg/g	20	0.4	0.6	--	--
1,2,3,4,7,8-HxCDF	70648-26-9	pg/g	21	0.2	0.568	--	--
1,2,3,6,7,8-HxCDD	57653-85-7	pg/g	16	0.3	0.6	--	--
1,2,3,6,7,8-HxCDF	57117-44-9	pg/g	20	0.2	0.554	--	--
1,2,3,7,8,9-HxCDD	19408-74-3	pg/g	16	0.4	0.6	1.0E+02	N
1,2,3,7,8,9-HxCDF	72918-21-9	pg/g	21	0.3	0.536	--	--
1,2,3,7,8-PeCDD	40321-76-4	pg/g	23	0.2	0.554	--	--
1,2,3,7,8-PeCDF	57117-41-6	pg/g	14	0.2	0.517	--	--
2,3,4,6,7,8-HxCDF	60851-34-5	pg/g	20	0.2	0.554	--	--
2,3,4,7,8-PeCDF	57117-31-4	pg/g	11	0.2	0.517	--	--
2,3,7,8-TCDD	1746-01-6	pg/g	24	0.093	0.3	4.3E+00	N
2,3,7,8-TCDF	51207-31-9	pg/g	4	0.1	0.2	--	--
Total HpCDFs	--	pg/g	11	0.3	0.517	--	--
Total HxCDDs	--	pg/g	4	0.4	0.476	--	--
Total HxCDFs	--	pg/g	9	0.2	0.517	--	--
Total PeCDDs	--	pg/g	15	0.2	0.517	--	--
Total PeCDFs	--	pg/g	9	0.2	0.517	--	--
Total TCDD	41903-57-5	pg/g	21	0.093	0.3	--	--
Total TCDF	55722-27-5	pg/g	3	0.1	0.2	--	--
TCL PAHs							
ACENAPHTHENE	83-32-9	ug/kg	20	5.8	51	4.7E+05	N
ACENAPHTHYLENE [7]	208-96-8	ug/kg	26	5.9	53	2.3E+05	N
ANTHRACENE	120-12-7	ug/kg	34	5.4	53	2.3E+06	N
BENZO(A)ANTHRACENE	56-55-3	ug/kg	19	2.2	10	2.2E+02	N
BENZO(A)PYRENE	50-32-8	ug/kg	23	1.6	10	2.2E+01	N
BENZO(B)FLUORANTHENE	205-99-2	ug/kg	21	1.7	10	2.2E+02	N
BENZO(G,H,I)PERYLENE [7]	191-24-2	ug/kg	30	3.6	10	2.3E+05	N
BENZO(K)FLUORANTHENE	207-08-9	ug/kg	22	1.4	10	2.2E+03	N
CHRYSENE	218-01-9	ug/kg	21	2.4	10	2.2E+04	N
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/kg	30	4.2	10	2.2E+01	N
FLUORANTHENE	206-44-0	ug/kg	9	2.1	2.1	3.1E+05	N
FLUORENE	86-73-7	ug/kg	35	14	53	3.1E+05	N
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/kg	29	2.5	10	2.2E+02	N
NAPHTHALENE	91-20-3	ug/kg	20	14	53	1.6E+05	N
PHENANTHRENE [7]	85-01-8	ug/kg	29	8.5	53	2.3E+05	N
PYRENE	129-00-0	ug/kg	11	4.3	20	2.3E+05	N

Table E.1-2.3
Non-detected Chemical MDL Screening for Area A - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
PCB Congeners							
123-PeCB	65510-44-3	pg/g	1	3.83	3.83	--	--
126-PeCB	57465-28-8	pg/g	1	3.83	3.83	--	--
169-HxCB	32774-16-6	pg/g	1	3.83	3.83	--	--
209-DeCB	2051-24-3	pg/g	1	3.83	3.83	--	--
81-TeCB	70362-50-4	pg/g	1	3.83	3.83	--	--
Explosives							
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	101	0.079	0.287	2.3E+02	N
1,3-DINITROBENZENE	99-65-0	mg/kg	102	0.0518	0.097	7.8E-01	N
2,4,6-TRINITROTOLUENE [8]	118-96-7	mg/kg	94	0.051	0.16	3.9E+00	N
2,4-DINITROTOLUENE	121-14-2	mg/kg	100	0.0728	0.12	1.6E+01	N
2,6-DINITROTOLUENE	606-20-2	mg/kg	101	0.0987	0.19	7.8E+00	N
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	96	0.088	1	1.6E+01	N
2-NITROTOLUENE	88-72-2	mg/kg	103	0.0707	0.16	7.8E+01	N
3-NITROTOLUENE	99-08-1	mg/kg	103	0.11	0.161	--	--
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	mg/kg	97	0.053	0.095	1.6E+01	N
4-NITROTOLUENE	99-99-0	mg/kg	103	0.116	0.27	3.1E+01	N
HMX (OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TET)	2691-41-0	mg/kg	102	0.1	0.242	3.9E+02	N
NITROBENZENE	98-95-3	mg/kg	103	0.0885	0.17	3.9E+00	N
RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	121-82-4	mg/kg	103	0.0887	0.28	5.8E+00	N
TETRYL (METHYL-2,4,6-TRINITROPHENYLNITRAMINE)	479-45-8	mg/kg	103	0.0587	0.4	3.1E+01	N
Nitroglycerin							
NITROGLYCERIN	55-63-0	mg/kg	88	1	1.69	7.8E-01	**Y**

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
R-RBC = Residential RBC

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available
SL = Screening Level
[1] = Mercuric chloride soil RBC value used
[2] = Chlordane RBC value was used
[3] = Alpha-BHC RBC value was used
[4] = Endosulfan RBC value was used
[5] = Endrin RBC value was used
[6] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[7] = Pyrene RBC value was used
[8] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

Table E.1-2.4
Area A Groundwater COPC Selection
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter	CAS #	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	C/N	Adjusted Tap Water RBC	MCL	COPC Flag (Y/N)	Rationale for Selection or Deletion
Perchlorate [A]													
Perchlorate	14797-73-0	0.31	2.9	ug/L	54MW10	5/7	0.08 - 0.08	2.9	N	2.6	24.5	Y	**ARBC**
TAL Metals [B]													
Aluminum	7429-90-5	59	221	ug/L	54MW5	2/3	29.5 - 29.5	221	N	3,650	--	N	BSL
Barium	7440-39-3	137	184	ug/L	54MW3	3/3	0.2 - 0.2	184	N	730	2,000	N	BSL
Barium, Dissolved	7440-39-3	139	190	ug/L	54MW3	3/3	0.2 - 0.2	190	N	730	2,000	N	BSL
Calcium	7440-70-2	49,300	88,300	ug/L	54MW5	3/3	26.2 - 26.2	88,300	--	--	--	Y	Nutrient
Calcium, Dissolved	7440-70-2	51,800	90,900	ug/L	54MW5	3/3	7.9 - 7.9	90,900	--	--	--	Y	Nutrient
Chromium [1]	7440-47-3	2.9	5.2	ug/L	54MW5	3/3	0.7 - 0.7	5.2	N	10.95	100	N	BSL
Chromium, Dissolved [1]	7440-47-3	0.6	1.6	ug/L	54MW3	3/3	0.6 - 0.6	1.6	N	10.95	100	N	BSL
Cobalt	7440-48-4	2.5	2.5	ug/L	54MW5	1/3	0.9 - 0.9	2.5	--	--	--	Y	NSV
Cobalt, Dissolved	7440-48-4	2.4	2.4	ug/L	54MW5	1/3	0.5 - 0.5	2.4	--	--	--	Y	NSV
Iron	7439-89-6	17.6	267	ug/L	54MW5	3/3	15 - 15	267	N	2,555	--	N	BSL
Magnesium	7439-95-4	21,100	29,900	ug/L	54MW3	3/3	7.4 - 7.4	29,900	--	--	--	Y	Nutrient
Magnesium, Dissolved	7439-95-4	20,700	29,800	ug/L	54MW3	3/3	5.3 - 5.3	29,800	--	--	--	Y	Nutrient
Manganese	7439-96-5	0.67	190.5	ug/L	54MW10 DUP AVG	6/6	0.2 - 1.68	190.5	N	73	--	Y	**ARBC**
Manganese, Dissolved	7439-96-5	0.29	185	ug/L	54MW10 DUP AVG	6/6	0.2 - 1.68	185	N	73	--	Y	**ARBC**
Nickel	7440-02-0	1.7	5.9	ug/L	54MW5	3/3	1.2 - 1.2	5.9	N	73	--	N	BSL
Nickel, Dissolved	7440-02-0	2.1	4.4	ug/L	54MW5	3/3	1 - 1	4.4	N	73	--	N	BSL
Potassium	7440-09-7	439	1,310	ug/L	54MW5	3/3	30.6 - 30.6	1,310	--	--	--	Y	Nutrient
Potassium, Dissolved	7440-09-7	805	2,210	ug/L	54MW5	3/3	68.4 - 68.4	2,210	--	--	--	Y	Nutrient
Selenium	7782-49-2	5.1	5.1	ug/L	54MW3	1/3	2.1 - 2.1	5.1	N	18.25	50	N	BSL
Selenium, Dissolved	7782-49-2	5	7.4	ug/L	54MW3	3/3	2.6 - 2.6	7.4	N	18.25	50	N	BSL
Sodium	7440-23-5	4,560	16,600	ug/L	54MW3	3/3	235 - 235	16,600	--	--	--	Y	Nutrient
Sodium, Dissolved	7440-23-5	3,140	14,900	ug/L	54MW3	3/3	99.3 - 99.3	14,900	--	--	--	Y	Nutrient
Vanadium, Dissolved	7440-62-2	0.46	0.46	ug/L	54MW5	1/3	0.4 - 0.4	0.46	N	3.65	--	N	BSL
Zinc	7440-66-6	4.1	27.6	ug/L	54MW3	3/3	0.6 - 0.6	27.6	N	1,095	--	N	BSL
Zinc, Dissolved	7440-66-6	4	28.9	ug/L	54MW3	3/3	1 - 1	28.9	N	1,095	--	N	BSL
TCL SVOCs [B]													
2,4-Dinitrotoluene	121-14-2	2	3	ug/L	54MW3	2/3	1 - 1	3.0E+00	N	7.3	--	N	BSL
SVOC TICs [B]													
Benzene, 2-methyl-1,3,5-trinitro-	118-96-7	15	15	ug/L	54MW3	1/3	0 - 0	1.5E+01	N	18.3	--	N	BSL
Explosives [A]													
1,3,5-Trinitrobenzene	99-35-4	0.17	6.5	ug/L	54MW10	3/7	0.045 - 0.045	6.5E+00	N	110	--	N	BSL
2,4,6-Trinitrotoluene [2]	118-96-7	0.38	17	ug/L	54MW10	4/7	0.1 - 0.1	1.7E+01	N	1.83	--	Y	**ARBC**
2,4-Dinitrotoluene	121-14-2	0.65	0.65	ug/L	54MW10	1/7	0.092 - 0.092	6.5E-01	N	7.3	--	N	BSL
Dinitrotoluene Mixture	--	0.65	0.65	ug/L	54MW10	1/7	0 - 0	6.5E-01	C	0.098	--	Y	**ARBC**
2-Nitrotoluene	88-72-2	0.82	0.82	ug/L	54MW2	1/7	0.28 - 0.28	8.2E-01	N	6.083	--	N	BSL
2-Amino-4,6-dinitrotoluene	35572-78-2	0.46	2.2	ug/L	54MW10	4/7	0.24 - 0.24	2.2E+00	N	7.3	--	N	BSL
4-Amino-2,6-dinitrotoluene	1946-51-0	0.42	1.8	ug/L	54MW10	5/7	0.22 - 0.22	1.8E+00	N	7.3	--	N	BSL
Aminodinitrotoluenes	--	0.42	4	ug/L	54MW10	5/7	0 - 0	4.0E+00	N	7.3	--	N	BSL
RDX	121-82-4	8	8	ug/L	54MW10	1/7	0.092 - 0.092	8.0E+00	C	0.609	--	Y	**ARBC**
HMX	2691-41-0	5.8	10	ug/L	54MW3	5/7	0.2 - 0.2	1.0E+01	N	182.5	--	N	BSL
Dioxin/Furans [C]													
Total 2,3,7,8-TCDD Equivalents [3]	--	6.51E-07	3.00E-04	ng/L	54MW2	2/3	--	3.0E-04	--	4.47E-04	--	N	BSL

Notes:

CAS = Chemical Abstracts Service
µg/L = Microgram Per Liter
ng/L = Nanogram Per Liter
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
C = Carcinogenic per EPA RBC Table (October 2007)
N = Noncarcinogenic per EPA RBC Table (October 2007)
MCL = Maximum Contaminant Level
BSL = Below Tap Water RBC/MCL
NSV = No Screening Value
DUP AVG = results for duplicate samples averaged
ARBC = Above Tap Water RBC

[1]=Chromium VI RBC used for screening
[2] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening
[3]=See Table 6.3B for Calculation of Total 2,3,7,8-TCDD Equivalents

[A] = Data from September 2007 used in screening
[B] = Data from 2003 - 2004 used in screening
[C] = Data from December 2006 used in screening

Table E.1-2.5
Area A Groundwater Non-Detects MDL Screening
SWMU 54 RFI/CMS Report
Radford Army Ammunition PLant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted T-RBC	Maximum MDL Exceeds SL
Perchlorate							
PERCHLORATE	14797-73-0	ug/L	12	0.1	1.84	2.56	N
PERCHLORATE (November/December 2006)	14797-73-0	ug/L	7	1.84	1.84	2.56	N
PERCHLORATE (March 2007)	14797-73-0	ug/L	2	0.036	0.036	2.56	N
PERCHLORATE (June 2007)	14797-73-1	ug/L	1	0.08	0.08	2.56	N
PERCHLORATE (September 2007)	14797-73-2	ug/L	2	0.2	0.2	2.56	N
TAL Metals							
ALUMINUM	7429-90-5	ug/L	1	29.5	29.5	3,650	N
ALUMINUM, DISSOLVED	7429-90-5	ug/L	5	11.8	100	3,650	N
ANTIMONY	7440-36-0	ug/L	6	1.8	10	1.46	**Y**
ANTIMONY, DISSOLVED	7440-36-0	ug/L	6	2.3	10	1.46	**Y**
ARSENIC	7440-38-2	ug/L	5	3.6	10	0.045	**Y**
ARSENIC, DISSOLVED	7440-38-2	ug/L	6	3.7	10	0.045	**Y**
BERYLLIUM	7440-41-7	ug/L	5	0.2	5	7.3	N
BERYLLIUM, DISSOLVED	7440-41-7	ug/L	6	0.2	5	7.3	N
CADMIUM	7440-43-9	ug/L	6	0.3	5	1.825	**Y**
CADMIUM, DISSOLVED	7440-43-9	ug/L	6	0.4	5	1.825	**Y**
CHROMIUM, DISSOLVED[1]	7440-47-3	ug/L	2	5	5	10.95	N
COBALT	7440-48-4	ug/L	2	0.9	0.9	--	NS
COBALT, DISSOLVED	7440-48-4	ug/L	2	0.5	0.5	--	NS
COPPER	7440-50-8	ug/L	5	1.2	5	146	N
COPPER, DISSOLVED	7440-50-8	ug/L	6	1.5	5	146	N
IRON, DISSOLVED	7439-89-6	ug/L	3	8.7	8.7	2,555	N
LEAD [2]	7439-92-1	ug/L	3	1.3	1.3	15	N
LEAD, DISSOLVED [2]	7439-92-1	ug/L	6	1.1	3	15	N
MANGANESE	7439-96-5	ug/L	4	1.64	1.68	73	N
MANGANESE, DISSOLVED	7439-96-5	ug/L	4	1.64	1.68	73	N
MERCURY [3]	7439-97-6	ug/L	5	0.1	0.2	--	NS
MERCURY, DISSOLVED [3]	7439-97-6	ug/L	6	0.1	0.2	--	NS
SELENIUM	7782-49-2	ug/L	4	2.1	5	18.25	N
SILVER	7440-22-4	ug/L	6	0.8	5	18.25	N
SILVER, DISSOLVED	7440-22-4	ug/L	6	0.7	5	18.25	N
THALLIUM	7440-28-0	ug/L	6	3.8	10	0.256	**Y**
THALLIUM, DISSOLVED	7440-28-0	ug/L	6	4.4	10	0.256	**Y**
VANADIUM	7440-62-2	ug/L	4	0.7	20	3.65	**Y**
VANADIUM, DISSOLVED	7440-62-2	ug/L	4	0.4	20	3.65	**Y**
Pesticides/PCBs							
4,4'-DDD	72-54-8	ug/L	7	0.0036	0.0036	2.8E-01	N
4,4'-DDE	72-55-9	ug/L	7	0.0036	0.0036	2.0E-01	N
4,4'-DDT	50-29-3	ug/L	7	0.0036	0.0036	2.0E-01	N
ALDRIN	309-00-2	ug/L	7	0.0027	0.0027	3.9E-03	N
ALPHA-BHC	319-84-6	ug/L	7	0.0034	0.0034	1.1E-02	N
ALPHA-CHLORDANE [4]	5103-71-9	ug/L	7	0.0033	0.0033	1.9E-01	N
BETA-BHC	319-85-7	ug/L	7	0.003	0.003	3.7E-02	N
DELTA-BHC [5]	319-86-8	ug/L	7	0.0031	0.0031	1.1E-02	N
DIELDRIN	60-57-1	ug/L	7	0.0032	0.0032	4.2E-03	N
ENDOSULFAN I	959-98-8	ug/L	7	0.0028	0.0028	2.2E+01	N
ENDOSULFAN II	33213-65-9	ug/L	7	0.0031	0.0031	2.2E+01	N
ENDOSULFAN SULFATE [6]	1031-07-8	ug/L	7	0.0041	0.0041	2.2E+01	N
ENDRIN	72-20-8	ug/L	7	0.0029	0.0029	1.1E+00	N
ENDRIN ALDEHYDE [7]	7421-93-4	ug/L	7	0.0037	0.0037	1.1E+00	N
ENDRIN KETONE [7]	53494-70-5	ug/L	7	0.0045	0.0045	1.1E+00	N
GAMMA-BHC (LINDANE)	58-89-9	ug/L	7	0.0026	0.0026	5.2E-02	N
GAMMA-CHLORDANE [4]	5103-74-2	ug/L	7	0.0034	0.0034	1.9E-01	N
HEPTACHLOR	76-44-8	ug/L	7	0.003	0.003	1.5E-02	N
HEPTACHLOR EPOXIDE	1024-57-3	ug/L	7	0.0031	0.0031	7.4E-03	N
METHOXYCHLOR	72-43-5	ug/L	7	0.0036	0.0036	1.8E+01	N
TOXAPHENE	8001-35-2	ug/L	7	0.1	0.1	6.1E-02	**Y**
AROCLOR 1016	12674-11-2	ug/L	7	0.046	0.046	2.6E-01	N
AROCLOR 1221	11104-28-2	ug/L	7	0.053	0.053	3.3E-02	**Y**
AROCLOR 1232	11141-16-5	ug/L	7	0.05	0.05	3.3E-02	**Y**
AROCLOR 1242	53469-21-9	ug/L	7	0.053	0.053	3.3E-02	**Y**
AROCLOR 1248	12672-29-6	ug/L	7	0.024	0.024	3.3E-02	N
AROCLOR 1254 [8]	11097-69-1	ug/L	7	0.038	0.038	3.3E-02	**Y**
AROCLOR 1260	11096-82-5	ug/L	7	0.045	0.045	3.3E-02	**Y**
SVOCs							
1,1'-BIPHENYL	92-52-4	ug/L	3	1	1	3.0E+01	N
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	ug/L	3	1	1	2.6E-01	**Y**
2,4,5-TRICHLOROPHENOL	95-95-4	ug/L	3	3	3	3.7E+02	N
2,4,6-TRICHLOROPHENOL	88-06-2	ug/L	3	3	3	3.6E+00	N
2,4-DICHLOROPHENOL	120-83-2	ug/L	3	2	2	1.1E+01	N
2,4-DIMETHYLPHENOL	105-67-9	ug/L	3	1	1	7.3E+01	N
2,4-DINITROPHENOL	51-28-5	ug/L	3	5	5	7.3E+00	N
2,4-DINITROTOLUENE	121-14-2	ug/L	1	1	1	7.3E+00	N
2,6-DINITROTOLUENE	606-20-2	ug/L	3	0.8	0.8	3.7E+00	N

Table E.1-2.5
Area A Groundwater Non-Detects MDL Screening
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Radford Army Ammunition PLant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted T-RBC	Maximum MDL Exceeds SL
2-CHLORONAPHTHALENE	91-58-7	ug/L	3	1	1	4.9E+01	N
2-CHLOROPHENOL	95-57-8	ug/L	3	2	2	3.0E+00	N
2-METHYLNAPHTHALENE	91-57-6	ug/L	3	2	2	2.4E+00	N
2-METHYLPHENOL	95-48-7	ug/L	3	1	1	1.8E+02	N
2-NITROANILINE	88-74-4	ug/L	3	2	2	--	NS
2-NITROPHENOL	88-75-5	ug/L	3	2	2	--	NS
3,3'-DICHLOROBENZIDINE	91-94-1	ug/L	3	1	1	1.5E-01	**Y**
3-NITROANILINE	99-09-2	ug/L	3	2	2	--	NS
4,6-DINITRO-2-METHYLPHENOL	534-52-1	ug/L	3	1	1	--	NS
4-BROMOPHENYL PHENYL ETHER	101-55-3	ug/L	3	10	10	--	NS
4-CHLORO-3-METHYLPHENOL	59-50-7	ug/L	3	1	1	--	NS
4-CHLOROANILINE	106-47-8	ug/L	3	1	1	1.5E+01	N
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	ug/L	3	10	10	--	NS
4-METHYLPHENOL	106-44-5	ug/L	3	2	2	1.8E+01	N
4-NITROANILINE	100-01-6	ug/L	3	2	2	--	NS
4-NITROPHENOL	100-02-7	ug/L	3	3	3	--	NS
ACENAPHTHENE	83-32-9	ug/L	3	1	1	3.7E+01	N
ACENAPHTHYLENE [9]	208-96-8	ug/L	3	1	1	1.8E+01	N
ACETOPHENONE	98-86-2	ug/L	3	1	1	6.1E+01	N
ANTHRACENE	120-12-7	ug/L	3	1	1	1.8E+02	N
ATRAZINE	1912-24-9	ug/L	3	0.5	0.5	3.0E-01	**Y**
BENZALDEHYDE	100-52-7	ug/L	3	3	3	3.7E+02	N
BIS(2-CHLOROETHOXY)METHANE	111-91-1	ug/L	3	1	1	--	NS
BIS(2-CHLOROETHYL)ETHER	111-44-4	ug/L	3	1	1	9.6E-03	**Y**
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	ug/L	3	1	1	4.8E+00	N
BENZO(A)ANTHRACENE	56-55-3	ug/L	3	0.9	0.9	3.0E-02	**Y**
BENZO(A)PYRENE	50-32-8	ug/L	3	0.9	0.9	3.0E-03	**Y**
BENZO(B)FLUORANTHENE	205-99-2	ug/L	3	2	2	3.0E-02	**Y**
BENZO(G,H,I)PERYLENE [9]	191-24-2	ug/L	3	0.9	0.9	1.8E+01	N
BENZO(K)FLUORANTHENE	207-08-9	ug/L	3	2	2	3.0E-01	**Y**
BUTYL BENZYL PHTHALATE	85-68-7	ug/L	3	10	10	7.3E+02	N
CAPROLACTAM	105-60-2	ug/L	3	1	1	1.8E+03	N
CARBAZOLE	86-74-8	ug/L	3	1	1	3.3E+00	N
CHRYSENE	218-01-9	ug/L	3	1	1	3.0E+00	N
DI-N-BUTYL PHTHALATE	84-74-2	ug/L	3	10	10	3.7E+02	N
DI-N-OCTYL PHTHALATE	117-84-0	ug/L	3	10	10	--	NS
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/L	3	0.8	0.8	3.0E-03	**Y**
DIBENZOFURAN	132-64-9	ug/L	3	1	1	3.7E+00	N
DIETHYL PHTHALATE	84-66-2	ug/L	3	10	10	2.9E+03	N
DIMETHYL PHTHALATE	131-11-3	ug/L	3	10	10	--	NS
FLUORANTHENE	206-44-0	ug/L	3	1	1	1.5E+02	N
FLUORENE	86-73-7	ug/L	3	0.9	0.9	2.4E+01	N
HEXACHLOROBENZENE	118-74-1	ug/L	3	1	1	4.2E-02	**Y**
HEXACHLOROBUTADIENE	87-68-3	ug/L	3	2	2	8.6E-01	**Y**
HEXACHLOROCYCLOPENTADIENE	77-47-4	ug/L	3	1	1	2.2E+01	N
HEXACHLOROETHANE	67-72-1	ug/L	3	1	1	3.7E+00	N
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/L	3	0.8	0.8	3.0E-02	**Y**
ISOPHORONE	78-59-1	ug/L	3	1	1	7.0E+01	N
N-NITROSO-DI-N-PROPYLAMINE	621-64-7	ug/L	3	1	1	9.6E-03	**Y**
N-NITROSODIPHENYLAMINE	86-30-6	ug/L	3	10	10	1.4E+01	N
NAPHTHALENE	91-20-3	ug/L	3	1	1	6.5E-01	**Y**
NITROBENZENE	98-95-3	ug/L	3	2	2	3.5E-01	**Y**
PENTACHLOROPHENOL	87-86-5	ug/L	3	3	3	5.6E-01	**Y**
PHENOL	108-95-2	ug/L	3	0.8	0.8	1.1E+03	N
PHENANTHRENE [9]	85-01-8	ug/L	3	1	1	1.8E+01	N
PYRENE	129-00-0	ug/L	3	1	1	1.8E+01	N
Dioxin/Furans							
OCDF	39001-02-0	ng/L	2	0.00521	0.00661	--	NS
1,2,3,4,6,7,8-HpCDD	35822-39-4	ng/L	2	0.00336	0.00355	--	NS
1,2,3,4,6,7,8-HpCDF	67562-39-4	ng/L	3	0.00258	0.0026	--	NS
1,2,3,4,7,8,9-HpCDF	55673-89-7	ng/L	3	0.00258	0.0026	--	NS
1,2,3,4,7,8-HxCDD	39227-28-6	ng/L	3	0.00258	0.0026	--	NS
1,2,3,4,7,8-HxCDF	70648-26-9	ng/L	3	0.00258	0.0026	--	NS
1,2,3,6,7,8-HxCDD	57653-85-7	ng/L	3	0.00258	0.0026	--	NS
1,2,3,6,7,8-HxCDF	57117-44-9	ng/L	3	0.00258	0.0026	--	NS
1,2,3,7,8,9-HxCDD	19408-74-3	ng/L	3	0.00258	0.0026	1.1E-02	N
1,2,3,7,8,9-HxCDF	72918-21-9	ng/L	3	0.00258	0.0026	--	NS
1,2,3,7,8-PeCDD	40321-76-4	ng/L	3	0.00258	0.0026	--	NS
1,2,3,7,8-PeCDF	57117-41-6	ng/L	3	0.00258	0.0026	--	NS
2,3,4,6,7,8-HxCDF	60851-34-5	ng/L	3	0.00258	0.0026	--	NS
2,3,4,7,8-PeCDF	57117-31-4	ng/L	2	0.00258	0.00259	--	NS
2,3,7,8-TCDD	1746-01-6	ng/L	3	0.00224	0.00459	4.5E-04	**Y**
2,3,7,8-TCDF	51207-31-9	ng/L	3	0.00121	0.00267	--	NS
Total HpCDDs	37871-00-4	ng/L	2	0.00336	0.00355	--	NS
Total HpCDFs	38998-75-3	ng/L	3	0.00258	0.0026	--	NS
Total HxCDDs	34465-46-8	ng/L	3	0.00258	0.0026	--	NS

Table E.1-2.5
Area A Groundwater Non-Detects MDL Screening
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Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted T-RBC	Maximum MDL Exceeds SL
Total HxCDFs	55684-94-1	ng/L	3	0.00258	0.0026	--	NS
Total PeCDDs	36088-22-9	ng/L	3	0.00258	0.0026	--	NS
Total PeCDFs	30402-15-4	ng/L	3	0.00258	0.0026	--	NS
Total TCDDs	41903-57-5	ng/L	3	0.00224	0.00459	--	NS
Total TCDFs	55722-27-5	ng/L	3	0.00121	0.00267	--	NS
PAHs							
ACENAPHTHENE	83-32-9	ug/L	3	0.3	0.3	3.7E+01	N
ACENAPHTHYLENE [9]	208-96-8	ug/L	3	0.22	0.22	1.8E+01	N
ANTHRACENE	120-12-7	ug/L	3	0.25	0.25	1.8E+02	N
BENZO(A)ANTHRACENE	56-55-3	ug/L	3	0.047	0.047	3.0E-02	**Y**
BENZO(A)PYRENE	50-32-8	ug/L	3	0.029	0.029	3.0E-03	**Y**
BENZO(B)FLUORANTHENE	205-99-2	ug/L	3	0.04	0.04	3.0E-02	**Y**
BENZO(G,H,I)PERYLENE [9]	191-24-2	ug/L	3	0.18	0.18	1.8E+01	N
BENZO(K)FLUORANTHENE	207-08-9	ug/L	3	0.05	0.05	3.0E-01	N
CHRYSENE	218-01-9	ug/L	3	0.061	0.061	3.0E+00	N
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/L	3	0.082	0.082	3.0E-03	**Y**
FLUORANTHENE	206-44-0	ug/L	3	0.074	0.074	1.5E+02	N
FLUORENE	86-73-7	ug/L	3	0.44	0.44	2.4E+01	N
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/L	3	0.089	0.089	3.0E-02	**Y**
NAPHTHALENE	91-20-3	ug/L	3	0.38	0.38	6.5E-01	N
PHENANTHRENE [9]	85-01-8	ug/L	3	0.21	0.21	1.8E+01	N
PYRENE	129-00-0	ug/L	3	0.12	0.12	1.8E+01	N
Explosives							
1,3,5-TRINITROBENZENE	99-35-4	ug/L	29	0.045	7.2	1.1E+02	N
1,3-DINITROBENZENE	99-65-0	ug/L	46	0.071	7.2	3.7E-01	**Y**
2,4,6-TRINITROTOLUENE [10]	118-96-7	ug/L	18	0.0749	7.2	1.8E+00	**Y**
2,4-DINITROTOLUENE	121-14-2	ug/L	44	0.092	7.2	7.3E+00	N
2,6-DINITROTOLUENE	606-20-2	ug/L	43	0.16	9.6	3.7E+00	**Y**
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	ug/L	21	0.2	9.6	7.3E+00	**Y**
2-NITROTOLUENE	88-72-2	ug/L	45	0.26	7.2	6.1E+00	**Y**
3-NITROTOLUENE	99-08-1	ug/L	46	0.17	7.2	--	NS
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	ug/L	27	0.22	9.6	7.3E+00	**Y**
4-NITROTOLUENE	99-99-0	ug/L	40	0.146	7.2	4.2E+00	**Y**
HMX (OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,	2691-41-0	ug/L	23	0.15	5	1.8E+02	N
NITROBENZENE	98-95-3	ug/L	43	0.0579	7.2	3.5E-01	**Y**
RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIA	121-82-4	ug/L	29	0.092	7.2	6.1E-01	**Y**
TETRYL (METHYL-2,4,6-TRINITROPHENYLNITRA	479-45-8	ug/L	34	0.15	9.6	1.5E+01	N
Nitroglycerin							
NITROGLYCERIN	55-63-0	ug/L	18	0.59	24	3.7E-01	**Y**

Notes:

CAS = Chemical Abstracts Service
µg/L = Microgram Per Liter
ng/L = Nanogram Per Liter
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
T-RBC = Tap Water RBC

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available
[1] = Chromium IV RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Chlordane RBC value was used
[5] = Alpha-BHC RBC value was used
[6] = Endosulfan RBC value was used
[7] = Endrin RBC value was used
[8] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[9] = Pyrene RBC value was used
[10] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

Table E.1-3.1
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Exposure to Contaminants in Area A Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Surface Soil	Aluminum	mg/kg	11,408	12,632	19,400	12,632	mg/kg	95% Student's t UCL	ProUCL 4.0
	Arsenic	mg/kg	1.33	1.49	2.5	1.49	mg/kg	95% Student's t UCL	ProUCL 4.0
	Chromium	mg/kg	18.93	20.46	29.5	20.46	mg/kg	95% Student's t UCL	ProUCL 4.0
	Cobalt	mg/kg	8.16	8.9	16	8.9	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Iron	mg/kg	19,036	20,416	27,200	20,416	mg/kg	95% Student's t UCL	ProUCL 4.0
	Lead	mg/kg	69.72	110.7	528	110.7	mg/kg	95% H-UCL	ProUCL 4.0
	Manganese	mg/kg	548.5	599.2	909	599.2	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Vanadium	mg/kg	28.23	32.03	55.3	32.03	mg/kg	95% Student's t UCL	ProUCL 4.0
	Heptachlor Epoxide	mg/kg	0.0088	0.023	0.11	0.023	mg/kg	95% UCL (Bounding)	FOD < 5%
	Aroclor 1254	mg/kg	0.0997	0.0688	0.2	0.0688	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2-Nitroaniline	mg/kg	0.023	0.028	0.055	0.028	mg/kg	95% UCL (Bounding)	FOD < 5%
	Di-n-octylphthalate	mg/kg	0.170	0.226	0.32	0.226	mg/lkg	95% KM (t) UCL	ProUCL 4.0
	Benzo(a)pyrene	mg/kg	0.0195	0.0155	0.058	0.0155	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Dibenz(a,h)anthracene	mg/kg	0.026	0.0211	0.036	0.0211	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Indeno(1,2,3-cd)pyrene	mg/kg	0.113	0.082	0.39	0.0816	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,4,6-Trinitrotoluene	mg/kg	33.7	13.6	130	13.6	mg/lkg	95% KM (t) UCL	ProUCL 4.0
	2,4-Dinitrotoluene	mg/kg	0.66	1.65	17	1.65	mg/kg	95% UCL (Bounding)	FOD < 5%
	2,6-Dinitrotoluene	mg/kg	0.49	1.13	11	1.13	mg/kg	95% UCL (Bounding)	FOD < 5%
	Dinitrotoluene Mix	mg/kg	1.08	2.72	28	2.72	mg/kg	95% UCL (Bounding)	FOD < 5%
	2,3,7,8-TCDD TEQ	mg/kg	2.76E-06	9.59E-06	1.70E-05	9.59E-06	mg/kg	95% Adjusted Gamma UCL	ProUCL 4.0

Notes:
FOD = frequency of detection
For FOD of 100% to 5%, ProUCL 4.0 was used.
For FOD of <5%, bounding was used.
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram

Table E.1-3.2
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Exposure to Contaminants in Area A Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Medium: Total Soil
Exposure Medium: Total Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Total Soil	Aluminum	mg/kg	11,480	12,227	19,400	12,227	mg/kg	95% Student's t UCL	ProUCL 4.0
	Antimony	mg/kg	0.535	0.87	4.8	0.87	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Arsenic	mg/kg	1.228	1.319	2.5	1.319	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Chromium	mg/kg	18.72	19.68	29.5	19.68	mg/kg	95% Student's t UCL	ProUCL 4.0
	Cobalt	mg/kg	8.332	8.789	16	8.789	mg/kg	95% Student's t UCL	ProUCL 4.0
	Iron	mg/kg	18,610	19,503	27,200	19,503	mg/kg	95% Student's t UCL	ProUCL 4.0
	Lead	mg/kg	45.85	126.5	528	126.5	mg/kg	97.5% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	Manganese	mg/kg	520.6	552.4	909	552.4	mg/kg	95% Student's t UCL	ProUCL 4.0
	Vanadium	mg/kg	27.51	29.63	55.3	29.63	mg/kg	95% Student's t UCL	ProUCL 4.0
	Heptachlor Epoxide	mg/kg	0.1319	0.04598	0.29	0.04598	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Aroclor 1254	mg/kg	0.0977	0.0463	0.2	0.0463	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2-Nitroaniline	mg/kg	0.0206	0.0233	0.055	0.0233	mg/kg	95% UCL (Bounding)	FOD < 5%
	Di-n-octylphthalate	mg/kg	0.165	0.217	0.385	0.217	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Benzo(a)anthracene	mg/kg	0.0405	0.0409	0.35	0.0409	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Benzo(a)pyrene	mg/kg	0.0685	0.146	0.675	0.146	mg/kg	97.5% KM (Chebyshev) UCL	ProUCL 4.0
	Benzo(b)fluoranthene	mg/kg	0.0755	0.0736	0.725	0.0736	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Dibenzo(a,h)anthracene	mg/kg	0.1360	0.0922	0.681	0.0922	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Indeno-(1,2,3-cd)pyrene	mg/kg	0.1560	0.0667	0.517	0.0667	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,4,6-Trinitrotoluene	mg/kg	22.16	7.217	130	7.217	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,4-Dinitrotoluene	mg/kg	6.107	1.247	17	1.247	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,6-Dinitrotoluene	mg/kg	6.05	2.274	11	2.274	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	Dintrotoluene Mix	mg/kg	10.17	1.91	28	1.91	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Nitroglycerin	mg/kg	1.31	2.36	32	2.36	mg/kg	95% UCL (Bounding)	FOD < 5%
	Total Equivalents 2,3,7,8-TCDD	mg/kg	1.64E-06	9.44E-06	1.70E-05	9.44E-06	mg/kg	99% Chebyshev (Mean, Sd) UCL	ProUCL 4.0

Notes:
FOD = frequency of detection
For FOD of 100% to 5%, ProUCL 4.0 was used.
For FOD of <5%, bounding was used.
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram

Table E.1-4.1a
Values used for Daily Intake Equations for Current/Future Scenario - Surface Soil - Exposure Medium Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Maintenance Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
Dermal Absorption *	Maintenance Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) Fraction ingested assumed 100%.

*See Table E.1-4.3 for chemical specific dermal absorption fractions

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

cm^2 = square centimeter

USEPA = U.S. Environmental Protection Agency

EPC = Exposure Point Concentration

Table E.1-4.1b
Values used for Daily Intake Equations for Current/Future Scenario - Surface Soil - Exposure Medium Air
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Maintenance Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.5	m^3/hr	USEPA, 1989	
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	(2)	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) PEFs provided on Table E.1-4.4

Note that VOCs were not analytes of interest for the site; therefore, the outdoor and indoor vapor inhalation pathways are not quantitatively assessed for the site.

USEPA, 1989. Risk Assessment Guidance for Superfund Volume I - Human Health Evaluation Manual (Part A). Interim Final. EPA/540/1-89/002.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

cm^2 = square centimeter

m^3/hour = cubic meters per hour

USEPA = U.S. Environmental Protection Agency

EPC = Exposure Point Concentration

Table E.1-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Construction Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				FI	Fraction Ingested	1	(unitless)	(1)	
				IRS	Ingestion Rate of Soil	330	mg/day	USEPA, 2002	
	Commercial Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(1)	
				IRS	Ingestion Rate of Soil	50	mg/day	USEPA, 2002	
	Resident	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(1)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
		Child	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(1)	
				IRS	Ingestion Rate of Soil	200	mg/day	USEPA, 1991	

Table E.1-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption*	Construction Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.3	mg/(cm^2-event)	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 2002	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Commercial Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Resident	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.07	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	5,700	cm^2	USEPA, 2004	

Table E.1-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption Cont.*	Resident Cont.	Child	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	$CDI\ (mg/kg\text{-}day) = \frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				AF	Soil-to-Skin Adherence Factor	0.2	$mg/(cm^2\text{-event})$	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	2,800	cm^2	USEPA, 2004	

Notes:

(1) Fraction ingested assumed 100%.

*See Table E.1-4.3 for chemical specific dermal absorption fractions

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

cm^2 = square centimeter

USEPA = U.S. Environmental Protection Agency

EPC = Exposure Point Concentration

Table E.1-4.1d
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Air
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Construction Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	2.5	m^3/hr	USEPA, 1991	
				PEF	Particulate Emission Factor	1.20E+06	m^3/kg	(1)	
	Commercial Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	25	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.0	m^3/hr	USEPA, 1989	
				PEF	Particulate Emission Factor	6.80E+08	m^3/kg	(1)	
	Resident	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	2	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.63	m^3/hr	(2)	
				PEF	Particulate Emission Factor	6.80E+08	m^3/kg	(1)	
		Child	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	6	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.5	m^3/hr	(3)	
				PEF	Particulate Emission Factor	6.80E+08	m^3/kg	(1)	

Notes:

(1) PEFs provided on Table E.1-4.4

(2) The inhalation rate is calculated using a daily long term rate of 15 m^3/day (USEPA, 1991) divided by 24 hours to derive hourly inhalation rate of 0.63 m^3/hour.

(3) The inhalation rate is calculated using a daily long term rate of 12 m^3/day (USEPA, 2003) divided by 24 hours to derive hourly inhalation rate of 0.5 m^3/hour.

Note that VOCs were not analytes of interest for the site; therefore, the outdoor and indoor vapor inhalation pathways are not quantitatively assessed for the site.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 1997. Exposure Factors Handbook. Office of Research and Development. EPA/600/P-95/002Fa through Fc.

kg/mg = Kilogram Per Millogram
mg/kg = Milligram Per Kilogram
hr/day = hour per day
cm^2 = square centimeter
m^3/hour = cubic meters per hour
USEPA = U.S. Environmental Protection Agency
EPC = Exposure Point Concentration

Table E.1-4.2
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Construction Worker	Adult	Groundwater	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	1E-06/0.1	µg/L	EPC	
				ED	Exposure Duration	1	years	USEPA, 1991	
				EF	Exposure Frequency	125	days/year	VDEQ, 2006	
				IRW	Ingestion Rate of Groundwater	0.02	L/day	VDEQ, 2006	
	Commercial Worker	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	1	L/day	USEPA, 1991	
	Resident	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	2	L/day	USEPA, 1991	
		Child	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	1	L/day	USEPA, 1991	

Table E.1-4.2
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
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Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption*	Construction Worker	Adult	Groundwater	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$
									where
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	*Organics:*
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	if $t_{event} \le t^*$, $DA_{event} = 2 \times CF1 \times CF2 \times FA \times Kp \times CW \times [(6 \times \tau_{event} \times t_{event})/\pi]^{1/2}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	1	years	USEPA, 1991	
				EF	Exposure Frequency	125	days/year	VDEQ, 2006	if $t_{event} > t^*$, $DA_{event} = CF1 \times CF2 \times FA \times Kp \times CW \times [(t_{event}/(1+B))+ 2 \times \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	(1)	*Inorganics:*
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	$DA_{event} = CF1 \times CF2 \times Kp \times CW \times t_{event}$
				t_{event}	Event Duration	4	hr/event	VDEQ, 2006	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	
	Commercial Worker	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$
									where
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	*Organics:*
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	if $t_{event} \le t^*$, $DA_{event} = 2 \times CF1 \times CF2 \times FA \times Kp \times CW \times [(6 \times \tau_{event} \times t_{event})/\pi]^{1/2}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	if $t_{event} > t^*$, $DA_{event} = CF1 \times CF2 \times FA \times Kp \times CW \times [(t_{event}/(1+B))+ 2 \times \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	800	cm^2	(2)	*Inorganics:*
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	$DA_{event} = CF1 \times CF2 \times Kp \times CW \times t_{event}$
				t_{event}	Event Duration	1	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	

Table E.1-4.2
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption Continued*	Resident	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$
									where
				BW	Body Weight	70	kg	USEPA, 1991	*Organics:*
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	if $t_{event} \le t^*$, DA_{event} = 2 x CF1 x CF2 x FA x Kp x CW x $[(6 \times \tau_{event} \times t_{event})/\pi]^{1/2}$
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	24	years	USEPA, 1991	if $t_{event} > t^*$, DA_{event} = CF1 x CF2 x FA x Kp x CW x $[(t_{event}/(1+B))+ 2 \times \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	*Inorganics:*
				SA	Skin Surface Area Available for Contact	18,000	cm^2	USEPA, 2004	DA_{event} = CF1 x CF2 x Kp x CW x t_{event}
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	
				t_{event}	Event Duration	0.58	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	
		Child	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$
									where
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	*Organics:*
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	if $t_{event} \le t^*$, DA_{event} = 2 x CF1 x CF2 x FA x Kp x CW x $[(6 \times \tau_{event} \times t_{event})/\pi]^{1/2}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	if $t_{event} > t^*$, DA_{event} = CF1 x CF2 x FA x Kp x CW x $[(t_{event}/(1+B))+ 2 \times \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	6,600	cm^2	USEPA, 2004	*Inorganics:*
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	DA_{event} = CF1 x CF2 x Kp x CW x t_{event}
				t_{event}	Event Duration	1	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	

Table E.1-4.2
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

(1) Best Professional Judgement. Based on the head, hands, and forearms.

(2) Best Professional Judgement. Based on the mean surface area for hands for men and women.

*See Table E.1-4.5 for chemical specific parameters used to calculate absorbed dose per event

Note that VOCs were not analytes of interest for the site; therefore, the outdoor and indoor vapor inhalation pathways are not quantitatively assessed for the site.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final.

VDEQ, 2006. Voluntary Remediation Program Risk Assessment Guidance. www.deq.virginia.gov/vrprisk/raguide.html.

kg = Kilogram

ug/L = Microgram Per Liter

mg/kg = milligram per kilogram

cm^2 = square centimeter

cm^3 = Cubic Centimeter

L/day = liter/day

USEPA = U.S. Environmental Protection Agency

VDEQ = Virginia Department of Environmental Quality

EPC = Exposure Point Concentration

Table E.1-4.3.RME
Dermal Absorption Fractions and Volatilization Factors for Soil/Sediment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	ABSd * (m^3/kg)	D_i (cm^2/s)	D_w (cm^2/s)	K_{oc} (cm^3/g)	K_d (cm^3/g)	H (unitless)	Da (cm^2/sec)	$VF_{C/I\ Worker}$/ $VF_{Maint.\ Worker}$ (m^3/kg)	$VF_{Const.\ Worker}$ (m^3/kg)	$VF_{Adult\ Resident}$ (m^3/kg)	$VF_{Child\ Resident}$ (m^3/kg)	$VF_{Adol.\ Tres.}$ (m^3/kg)
Aluminum	7429-90-5	1.00E-02	--	--	--	--	--	--	--	--	--	--	--
Antimony	7440-36-0	1.00E-02	--	--	--	--	--	--	--	--	--	--	--
Arsenic	7440-38-2	3.00E-02	--	--	--	--	--	--	--	--	--	--	--
Chromium	7440-47-3	1.00E-02	--	--	--	--	--	--	--	--	--	--	--
Cobalt	7440-48-4	1.00E-02	--	--	--	--	--	--	--	--	--	--	--
Iron	7439-89-6	1.00E-02	--	--	--	--	--	--	--	--	--	--	--
Manganese	7439-96-5	1.00E-02	--	--	--	--	--	--	--	--	--	--	--
Thallium	7440-28-0	1.00E-02	--	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	1.00E-02	--	--	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	1024-57-3	1.00E-01	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1254	11097-69-1	1.40E-01	--	--	--	--	--	--	--	--	--	--	--
2-Nitroaniline	88-74-4	1.00E-01	--	--	--	--	--	--	--	--	--	--	--
Di-n-octylphthalate	117-84-0	1.00E-01	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	56-55-3	1.30E-01	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	1.30E-01	--	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	205-99-2	1.30E-01	--	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	53-70-3	1.30E-01	--	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	1.30E-01	--	--	--	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene[1]	118-96-7	3.00E-02	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	121-14-2	1.00E-01	--	--	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	606-20-2	1.00E-01	--	--	--	--	--	--	--	--	--	--	--
Dinitrotoluene Mix[2]	--	1.00E-01	--	--	--	--	--	--	--	--	--	--	--
Nitroglycerin [1]	55-63-0	1.00E-02	--	--	--	--	--	--	--	--	--	--	--
2,3,7,8-TCDD Equivalents	1746-01-6	3.00E-02	--	--	--	--	--	--	--	--	--	--	--

Notes:
VOCs were not identified as COPC in
CAS = Chemical Abstract Service
ABS_d = Dermal Absorption Fraction
VF = Volatilization Factor
D_a = Apparent Diffusivity
m^3/kg = cubic meters per kilogram
cm2/s = centimeter squared per second

*ABS_d values are taken from Exhibit 3-4, Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation and Manual, Part E; Supplemental Guidance for Dermal Risk Assessment, July 2004, and Region III Technical Guidance, Assessing Dermal Exposure in Soil, December 1995.
[1] = ABSd value for 2,4,6-Trinitrotoluene and nitroglycerin from RAIS
[2]= ABSd value for 2,4-Dintrotoluene used for Dinitrotoluene Mix

D_a values calculated using the following equation and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.
Equation 4-8 from USEPA, 2002:

$D_a = [((\Theta_a^{10/3} \times Di \times H) + (\Theta_w^{10/3} \times D_w))/n^2]/[((\rho_b \times K_d) + \Theta_w + (\Theta_a \times H)]$

Θ_a (L_{air}/L_{soil}) =	0.28
Θ_w (L_{water}/L_{soil}) =	0.15
D_i(cm2/sec) =	varies
D_w(cm2/sec) =	varies
H(unitless) =	varies
n (L_{Pore}/L_{soil}) =	0.43
ρ_b (g/cm^3) =	1.50
K_d (cm^3/g) =	varies
K_{oc} (cm^3/g) =	varies
foc (g/g) =	0.006

VF (soil only) values for construction worker were calculated using the following equations and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.
Equation 5-14 from USEPA 2002:

$VF = Q/C_{sa} * 1/F_D * (3.14 * D_A * T)^{1/2} * CF/(2 * \rho_b * D_A)$

Q/C_{sa} (g/m^2-s)/kg/m^3) =	11.40	calculated value
F_D (unitless) =	0.185	default
D_A (cm^2/sec) =	varies	chemical specific (see above)
T (sec) =	3.15E+07	receptor specific exposure interval (T= ED(yrs)*365 days/year*24 hours/day*60 min/hour*60sec/min)
CF (m^2/cm^2) =	1.00E-04	default
ρ_b (kg/L) =	1.5	default

Equation 5-15 from USEPA, 2002:

$Q/C_{sa} = A * e^{\wedge}((\ln A_c$	11.40	
A=	2.4538	default
B =	17.566	default
C =	189.0426	default
A_c (acres)=	1.69	contaminated site area

Notes (continued):

VF (soil only) values for commercial/industrial worker, adult resident, and child resident, and adolescent tresspasser calculated using the following equations and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

Equation 4-8 from USEPA, 2002:

$VF = Q/C_{vol}*(3.14*D_A*T)^{1/2}*CF/(2*\rho_b*D_a)$

Q/C_{vol} (g/m2-s)/kg/m3) =	46.89	calculated value
D_A (cm^2/sec) =	varies	chemical specific (see above)
T (sec) =	varies	receptor specific exposure interval (T= ED(yrs)*365 days/year*24 hours/day*60 min/hour*60sec/min)
		(Maintenance Worker=7.88E+08 sec, Commercial/Industrial Worker=7.88E+08 sec, Adult Resident=7.56E+08, and Child Resident=1.89E+08)
CF (m^2/cm^2) =	1.00E-04	default
ρ_b (g/cm^3)	1.5	default

Exhibit D-3 from USEPA, 2002:

$Q/C_{vol} = A*e^{((\ln A_{site} - B)^2/C)}$ =	46.89	
A =	9.9253	Huntington value
B =	18.6636	Huntington value
C =	211.8862	Huntington value
A_{site} (acres)=	1.69	contaminated site area

Table E.1-4.4.RME
PEF Calculations - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Commercial/Industrial Worker

Equation 4-5 from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$PEF = Q / C_{wind} \cdot \frac{3{,}600 s/h}{0.036 \cdot (1-V) \cdot (U_m / U_t)\text{^}3 \cdot F(x)}$$

Parameter	Value	
PEF	6.80E+08	
Q/C_{wind}	46.89	calculated below
V	0.5	default
U_m	4.69	default
U_t	11.32	default
F(x)	0.194	default

PEF = particulate emission factor (m^3/kg)
s/h = seconds per hour
Q/Cwind = Inverse of the ratio of the geometric mean air concentration to the emission flux at the center of a square source (g/m^3-s per kg/m^3)
V = fraction of vegatative cover (unitless)
U_m = mean annual windspeed (m/s)
U_t = equivalent threshold value of windspeed at 7m (m/s)
F(x) = function dependent on Um/Ut derived using Cowherd et al. (1985)
Site Area = 1.69

Q/C_{wind} calculated in accordance with Exhibit D-2 from USEPA, 2002 using A, B, and C values for Huntington, WV:
$Q/C_{wind} = A*e\text{^}((\ln A_{site} - B)^2/C))$

Q/C_{wind}=	46.89	
A =	9.9253	unitless
B =	18.6636	unitless
C =	211.8862	unitless
A_{site}=	1.69	acres

Table E.1-4.4.RME
PEF Calculations - Area A
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Radford Army Ammunition Plant, Radford, Virginia

Construction Worker

Equation 5-5 from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$PEF_{sc} = Q / C_{sr} \cdot \frac{1}{F_D} \cdot \left[\frac{T \cdot A_R}{556 \cdot (W/3)^{\wedge} 0.4 \cdot \frac{(365\ d/yr - p)}{365\ d/yr} \cdot \sum VKT} \right]$$

Parameter	Value	
PEF_{sc}	1.20E+06	
Q/C_{sr}	18.89	calculated
F_D	0.185	default
T (sec)	7,488,000	assumed-see below
A_R (m^2)	504	calculated
W (tons)	8	assumed-see below
p (days/yr)	140	determined-see below
sumVKT (km)	632	assumed-see below

PEF_{sr} = subchronic road particulate emission factor (m^3/kg)

Q/C_{sr} = Inverse of the ratio of the 1-h geometric mean air concentration to the emission flux along a straight road segment bisecting a square site (g/m2-s per kg/m3)

F_D = dispersion correction factor (unitless)

T = total time over which construction occurs-total time period assumed to be 6 months (52wks x 5days per week x 8 hours per day x 3,600 s per hour)

A_R = surface area of contaminated road segment (m^2)

L_R = length of road segment (assumed to equal to (1.69 acres*43,560 ft^2/acre)$^{1/2}$)

W_R = width of road segment (assumed to be 20 ft)

$A_R = L_R \times W_R \times 0.092903 m^2/ft^2$

A_R= 504 m^2

W = mean vehicle weight assumed to be 8 tons ([(20 cars * 2 tons/car)+(10 trucks*20 tons/truck)]/30 vehicles)

p = number of days with at least 0.01 inches of precipitation (from Exhibit 5-2 140 days/year)

sumVKT = sum of fleet vehicle kilometers traveled during the exposure duration (km) (30 of vehicles x 0.081 of km/day x 52wks x 5 days/wk)

Q/C_{sr} calculated in accordance with Equation 5-6:

using A, B, and C default values:

$Q/C_{sr} = A*e^{\wedge}((\ln A_s - B)^2/C))$

Q/C_{sr}=	18.89	g/m^2-s per kg/m^3
A =	12.9351	unitless
B =	5.7383	unitless
C =	71.7711	unitless
A_s =	1.69	acres

Table E.1-4.5
Parameter Values Used for Groundwater - Area A
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Analyte	CAS	FA	Kp (cm/hr)	tau $_{event}$ (hr)	B	t* (hr)
Cobalt	7440-36-0	--	1.0E-03	--	--	--
Manganese	7439-96-5	--	1.0E-03	--	--	--
Perchlorate	14797-73-0	--	1.0E-03	--	--	--
4-Nitrotoluene*	99-99-0	1.0	1.0E-02	6.2E-01	4.5E-02	1.5E+00
2,4,6-Trinitrotoluene*	118-96-7	1.0	1.1E-03	2.0E+00	6.2E-03	4.7E+00
Dinitrotoluene Mix[1]	--	1.0	3.1E-03	1.1E+00	1.6E-02	2.7E+00
RDX*	121-82-4	1.0	3.5E-04	1.8E+00	2.0E-03	4.4E+00

Notes:

Organic parameter values are taken from Organic values from Organic Chemicals in Water Spreadsheet (http://www.epa.gov/oswer/riskassessment/ragse/index.htm) except chemicals denoted with * which were calculated using equations from Appendix A, Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation Manual, Part E; Supplemental Guidance for Dermal Risk Assessment, July 2004, and molecular weight and log Kow values from RAIS (http://rais.ornl.gov).

Inorganic parameters were taken from Exhibit 3-1, Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation Manual, Part E; Supplemental Guidance for Dermal Risk Assessment. July 2004, with the exception of perchorate which was from RAIS (http://rais.ornl.gov).

[1] = Values for 2,4-DNT used for DNT Mixture

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Table E.1-5.1
Non-Cancer Toxicity Data - Oral/Dermal - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s)
Aluminum	7429-90-5	Chronic	1.00E+00	mg/kg-day	1	1.00E+00	mg/kg-day	developmental CNS	100	PPRTV	07/26/2001
Antimony	7440-36-0	Chronic	4.00E-04	mg/kg-day	0.15	6.00E-05	mg/kg-day	blood	1000	IRIS	04/02/2007
Antimony	7440-36-0	Subchronic	2.00E-04	mg/kg-day	0.15	3.00E-05	mg/kg-day	blood	300	PPRTV	07/26/1999
Arsenic	7440-38-2	Chronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	skin/ vascular	3	IRIS	04/02/2007
Arsenic	7440-38-2	Subchronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	skin	3	HEAST	07/31/1997
Chromium(2)	7440-47-3	Chronic	3.00E-03	mg/kg-day	0.025	7.50E-05	mg/kg-day	NOAEL	900	IRIS	04/02/2007
Chromium(2)	7440-47-3	Subchronic	2.00E-02	mg/kg-day	0.025	5.00E-04	mg/kg-day	NOAEL	100	HEAST	07/31/1997
Cobalt	7440-48-4	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	blood	10	PPRTV	01/15/2002
Iron	7439-89-6	Chronic	7.00E-01	mg/kg-day	1	7.00E-01	mg/kg-day	blood/ liver/ GI tract	1	PPRTV, Region III	error
Manganese (non-food)	7439-96-5	Chronic	2.00E-02	mg/kg-day	0.04	8.00E-04	mg/kg-day	CNS	1	IRIS	04/02/2007
Thallium	7440-28-0	Chronic	7.00E-05	mg/kg-day	1	7.00E-05	mg/kg-day	liver/ blood/ hair	3000	Other, Region III	10/31/2006
Vanadium	7440-62-2	Chronic	1.00E-03	mg/kg-day	0.026	2.60E-05	mg/kg-day	kidney	NA	NCEA, Region III	10/25/2005
Vanadium	7440-62-2	Subchronic	7.00E-03	mg/kg-day	0.026	1.80E-04	mg/kg-day	kidney/ blood	100	HEAST	07/31/1997
Heptachlor Epoxide	1024-57-3	Chronic	1.30E-05	mg/kg-day	1	1.30E-05	mg/kg-day	liver	1000	IRIS	04/02/2007
Heptachlor Epoxide	1024-57-3	Subchronic	1.30E-05	mg/kg-day	1	1.30E-05	mg/kg-day	liver	1000	HEAST	07/31/1997
Aroclor 1254	11097-69-1	Chronic	2.00E-05	mg/kg-day	1	2.00E-05	mg/kg-day	eyes	300	IRIS	04/02/2007
Aroclor 1254	11097-69-1	Subchronic	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	immune system	100	HEAST	07/31/1997
2-Nitroaniline	88-74-4	Chronic	3.00E-03	mg/kg-day	1	3.00E-03	mg/kg-day	blood	100	PPRTV	09/24/2002
Di-n-octylphthalate	117-84-0	Chronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	liver/thyroid	1000	PPRTV	09/11/2002
Di-n-octylphthalate	117-84-0	Subchronic	4.00E-01	mg/kg-day	1	4.00E-01	mg/kg-day	liver/thyroid	100	PPRTV	09/11/2002
Benzo(a)anthracene	56-55-3	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	118-96-7	Chronic	5.00E-04	mg/kg-day	1	5.00E-04	mg/kg-day	liver	1000	IRIS	04/02/2007
2,4-Dinitrotoluene	121-14-2	Chronic	2.00E-03	mg/kg-day	1	2.00E-03	mg/kg-day	CNS/ blood/ liver	100	IRIS	04/02/2007
2,4-Dinitrotoluene	121-14-2	Subchronic	2.00E-03	mg/kg-day	1	2.00E-03	mg/kg-day	CNS/ blood/ liver	100	HEAST	07/31/1997
2,6-Dinitrotoluene	606-20-2	Chronic	1.00E-03	mg/kg-day	1	1.00E-03	mg/kg-day	CNS/ blood/ liver	3000	HEAST	07/31/1997
2,6-Dinitrotoluene	606-20-2	Subchronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	CNS/ blood/ liver	300	HEAST	07/31/1997
Dinitrotoluene Mix(3)	--	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	99-99-0	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
RDX	121-82-4	Chronic	3.00E-03	mg/kg-day	1	3.00E-03	mg/kg-day	prostate	100	IRIS	04/02/2007
RDX	121-82-4	Subchronic	3.00E-03	mg/kg-day	1	3.00E-03	mg/kg-day	prostate	100	HEAST	7/37/1997
Nitroglycerin	55-63-0	Chronic	1.00E-04	mg/kg-day	1	1.00E-04	mg/kg-day	vascular	NA	PPRTV, Region III	04/10/2007
Perchlorate	14797-73-0	Chronic	7.00E-04	mg/kg-day	1	7.00E-04	mg/kg-day	thyroid	10	IRIS	04/02/2007
2,3,7,8-TCDD Eqivalents	1746-01-6	NA	NA	NA	1	NA	NA	NA	NA	NA	NA

Notes:

CAS = Chemical Abstract Service
RfD = Reference Dose
mg/(kg-d) = milligrams per kilogram day
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables

PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available
(1) Oral absorption efficiency for dermal from Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005. 2004.
(2) Chromium VI toxicity value used
(3) Noncarcinogenic hazard for 2,4-Dinitrotoluene and 2,6-Dinitrotoluene evaluated independantly for each compound

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III, VDEQ, and HEAST.
For IRIS values, the date of the IRIS search is provided.
For HEAST values, the date of HEAST is provided.
For Region III values, the date of the Region III RBC Table is provided.
For PPRTV/NCEA, date of paper is provided.

Table E.1-5.2
Non-Cancer Toxicity Data - Inhalation - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units	Value	Units			Source(s)	Date(s)
Aluminum	7429-90-5	Chronic	0.00E+00	mg/m3	1.00E-03	mg/kg-day	CNS	300	PPRTV	07/26/2001
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	Subchronic	4.00E-04	mg/m3	1.10E-04	mg/kg-day	lungs	100	PPRTV	07/26/1999
Arsenic	7440-38-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium(1)	7440-47-3	Chronic	1.00E-04	mg/m3	3.00E-05	mg/kg-day	respiratory	300	IRIS	04/02/2007
Cobalt	7440-48-4	Chronic	2.00E-05	mg/m3	5.70E-06	mg/kg-day	respiratory	100	PPRTV	01/15/2002
Iron	7439-89-6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (non-food)	7439-96-5	Chronic	5.00E-05	mg/m3	1.40E-05	mg/kg-day	CNS	1000	IRIS	04/02/2007
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	1024-57-3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	88-74-4	Chronic	1.00E-04	mg/m3	2.90E-05	mg/kg-day	nose	3000	PPRTV	09/24/2002
2-Nitroaniline	88-74-4	Subchronic	1.00E-03	mg/m3	2.90E-04	mg/kg-day	nose	300	PPRTV	09/24/2002
Di-n-octylophthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	56-55-3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	118-96-7	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	121-14-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	606-20-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix (2)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	99-99-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	121-82-4	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	55-63-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	14797-73-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD Eqivalents	1746-01-6	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

RfC = Reference Concentration
RfD = Reference Dose
mg/m^3 = milligrams per cubic meter
mg/(kg-d) = milligrams per kilogram day
Region III = U.S. Environmental Protection Agency, Region III

NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
VDEQ = Virginia Department of Environmental Quality
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III, VDEQ, and HEAST.
For IRIS values, the date of the IRIS search is provided.
For PPRTV values, the date of the paper is provided.

(1) Toxicity data for chromium VI particulates
(2) Noncarcinogenic hazard for 2,4-Dinitrotoluene and 2,6-Dinitrotoluene evaluated independantly for each compound

Table E.1-6.1
Cancer Toxicity Data - Oral/Dermal - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
		Value	Units		Value	Units		Source(s)	Date(s)
Aluminum	7429-90-5	NA	NA	1	NA	NA	NA	NA	NA
Antimony	7440-36-0	NA	NA	0.15	NA	NA	NA	NA	NA
Arsenic	7440-38-2	1.50E+00	1/(mg/kg-day)	1	1.50E+00	1/(mg/kg-day)	A	IRIS	04/02/2007
Chromium[(2)]	7440-47-3	NA	NA	0.025	NA	NA	Cannot Be Determined	IRIS	04/02/2007
Cobalt	7440-48-4	NA	NA	1	NA	NA	NA	NA	NA
Iron	7439-89-6	NA	NA	1	NA	NA	NA	NA	NA
Manganese (non-food)	7439-96-5	NA	NA	0.04	NA	NA	D	IRIS	04/02/2007
Thallium	7440-28-0	NA	NA	1	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	0.026	NA	NA	NA	NA	NA
Heptachlor Epoxide	1024-57-3	9.10E+00	1/(mg/kg-day)	1	9.10E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
Aroclor 1254	11097-69-1	2.00E+00	1/(mg/kg-day)	1	2.00E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
2-Nitroaniline	88-74-4	NA	NA	1	NA	NA	NA	NA	NA
Di-n-octylphthalate	117-84-0	NA	NA	1	NA	NA	NA	NA	NA
Benzo(a)anthracene	56-55-3	7.30E-01	1/(mg/kg-day)	1	7.30E-01	1/(mg/kg-day)	B2	IRIS/NCEA	04/02/2007
Benzo(a)pyrene	50-32-8	7.30E+00	1/(mg/kg-day)	1	7.30E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
Benzo(b)fluoranthene	205-99-2	7.30E-01	1/(mg/kg-day)	1	7.30E-01	1/(mg/kg-day)	B2	IRIS	04/02/2007
Dibenz(a,h)anthracene	53-70-3	7.30E+00	1/(mg/kg-day)	1	7.30E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
Indeno(1,2,3-cd)pyrene	193-39-5	7.30E-01	1/(mg/kg-day)	1	7.30E-01	1/(mg/kg-day)	B2	IRIS	04/02/2007
2,4,6-Trinitrotoluene	118-96-7	3.00E-02	1/(mg/kg-day)	1	3.00E-02	1/(mg/kg-day)	C	IRIS	04/02/2007
2,4-Dinitrotoluene[(3)]	121-14-2	NA	NA	1	NA	NA	NA	NA	NA
2,6-Dinitrotoluene[(3)]	606-20-2	NA	NA	1	NA	NA	NA	NA	NA
Dinitrotoluene Mix	--	6.80E-01	1/(mg/kg-day)	1	6.80E-01	1/(mg/kg-day)	B2	IRIS	04/02/2007
RDX	121-82-4	1.10E-01	1/(mg/kg-day)	1	3.00E-02	1/(mg/kg-day)	C	IRIS	04/02/2007
4-Nitrotoluene	99-99-0	NA	NA	1	NA	NA	NA	NA	NA
Nitroglycerin	55-63-0	1.70E-02	1/(mg/kg-day)	1	1.70E-02	1/(mg/kg-day)	C	PPRTV, Region III	04/10/2007
Perchlorate	14797-73-0	NA	NA	1	NA	NA	NA	NA	NA
2,3,7,8-TCDD Eqivalents	1746-01-6	1.50E+05	1/(mg/kg-day)	1	1.50E+05	1/(mg/kg-day)	B2	HEAST	07/31/1997

Table E.1-6.1
Cancer Toxicity Data - Oral/Dermal - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

CSF = Cancer Slope Factor
mg/(kg-d) = Milligrams Per Kilogram Day
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
NA = Not Available
PPRTV = Provisional Peer Reviewed Toxicity Values

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III and VDEQ.
For IRIS values, the date of the IRIS search is provided.
For Region III values, the date of the Region III RBC Table is provided.
For HEAST values, the date of the HEAST Table is provided.

Cancer Guideline Description:

A = Human carcinogen
B1 = Probable human carcinogen - indicates that limited human data are available.
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C = Possible human carcinogen
D = Not classifiable as a human carcinogen

(1) Oral absorption efficiency for dermal from Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. . EPA/540/R/99/005. 2004
(2) Chromium VI toxicity data used.
(3) Carcinogenic risk for 2,4-Dinotrotoluene and 2,6-Dinitrotoluene evaluated as Dinitrotoluene Mix

Table E.1-6.2
Cancer Toxicity Data - Inhalation - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description	CSF	
		Value	Units	Value	Units		Source(s)	Date(s)
Aluminum	7429-90-5	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA
Arsenic	7440-38-2	4.30E+00	1/(mg/m3)	1.50E+01	1/(mg/kg-day)	A	IRIS	04/02/2007
Chromium(1)	7440-47-3	1.20E+01	1/(mg/m3)	4.20E+01	1/(mg/kg-day)	A	IRIS	04/02/2007
Cobalt	7440-48-4	2.80E+00	1/(mg/m3)	9.80E+00	1/(mg/kg-day)	B2	PPRTV	01/15/2002
Iron	7439-89-6	NA	NA	NA	NA	NA	NA	NA
Manganese (non-food)	7439-96-5	NA	NA	NA	NA	D	IRIS	04/02/2007
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	1024-57-3	2.60E+00	1/(mg/m3)	9.10E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
Aroclor 1254	11097-69-1	5.71E-01	1/(mg/m3)	2.00E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
2-Nitroaniline	88-74-4	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	56-55-3	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	8.86E-01	1/(mg/m3)	3.10E+00	1/(mg/kg-day)	B2	NCEA, Region III	04/10/2007
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	118-96-7	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene(2)	121-14-2	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene(2)	606-20-2	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix	--	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	99-99-0	NA	NA	NA	NA	NA	NA	NA
RDX	121-82-4	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	55-63-0	NA	NA	NA	NA	NA	NA	NA
Perchlorate	14797-73-0	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD Eqivalents	1746-01-6	4.29E+04	1/(mg/m3)	1.50E+05	1/(mg/kg-day)	B2	HEAST	07/31/1997

Table E.1-6.2
Cancer Toxicity Data - Inhalation - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

CSF = Cancer Slope Factor
mg/(kg-d) = Milligrams Per Kilogram Day
USEPA = U.S. Environmental Protection Agency
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III and VDEQ.
For IRIS values, the date of the IRIS search is provided.
For NCEA, Region III values, the date of the Region III RBC Table is provided.
For PPRTV values, the date of the paper is provided.

Cancer Guideline Description:
A = Human carcinogen
B1 = Probable human carcinogen - indicates that limited human data are available.
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C = Possible human carcinogen
D = Not classifiable as a human carcinogen

(1) = Chromium VI toxicity data used
(2) Carcinogenic risk for 2,4-Dinotrotoluene and 2,6-Dinitrotoluene evaluated as Dinitrotoluene Mix

TABLE E.1-7.1.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Soil	Soil	Ingestion	Aluminum	1.26E+04	mg/kg	8.83E-04	mg/kg-day	--	--	--	2.47E-03	mg/kg-day	1.00E+00	mg/kg-day	2.5.E-03
				Arsenic	1.49E+00	mg/kg	1.04E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	1.6.E-07	2.92E-07	mg/kg-day	3.00E-04	mg/kg-day	1.E-03
				Chromium	2.05E+01	mg/kg	1.43E-06	mg/kg-day	--	--	--	4.01E-06	mg/kg-day	3.00E-03	mg/kg-day	1.3.E-03
				Cobalt	8.90E+00	mg/kg	6.22E-07	mg/kg-day	--	--	--	1.74E-06	mg/kg-day	2.00E-02	mg/kg-day	9.E-05
				Iron	2.04E+04	mg/kg	1.43E-03	mg/kg-day	--	--	--	4.00E-03	mg/kg-day	7.00E-01	mg/kg-day	5.7.E-03
				Manganese	5.99E+02	mg/kg	4.19E-05	mg/kg-day	--	--	--	1.17E-04	mg/kg-day	2.00E-02	mg/kg-day	6.E-03
				Vanadium	3.20E+01	mg/kg	2.24E-06	mg/kg-day	--	--	--	6.26E-06	mg/kg-day	1.00E-03	mg/kg-day	6.E-03
				Heptachlor epoxide	2.30E-02	mg/kg	1.61E-09	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	1.E-08	4.50E-09	mg/kg-day	1.30E-05	mg/kg-day	3.E-04
				Aroclor 1254	7.50E-03	mg/kg	5.24E-10	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-09	1.47E-09	mg/kg-day	2.00E-05	mg/kg-day	7.E-05
				2-Nitroaniline	2.80E-02	mg/kg	1.96E-09	mg/kg-day	--	--	--	5.48E-09	mg/kg-day	3.00E-03	mg/kg-day	2.E-06
				Di-n-octylphthalate	2.26E-01	mg/kg	1.58E-08	mg/kg-day	--	--	--	4.42E-08	mg/kg-day	4.00E-02	mg/kg-day	1.E-06
				Benzo(a)pyrene	1.55E-02	mg/kg	1.08E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	8.E-09	3.03E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	2.11E-02	mg/kg	1.47E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.E-08	4.13E-09	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	8.16E-02	mg/kg	5.70E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	4.E-09	1.60E-08	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	1.36E+01	mg/kg	9.51E-07	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	3.E-08	2.66E-06	mg/kg-day	5.00E-04	mg/kg-day	5.E-03
				2,4-Dinitrotoluene	1.65E+00	mg/kg	1.15E-07	mg/kg-day	--	--	--	3.23E-07	mg/kg-day	2.00E-03	mg/kg-day	2.E-04
				2,6-Dinitrotoluene	1.13E+00	mg/kg	7.90E-08	mg/kg-day	--	--	--	2.21E-07	mg/kg-day	1.00E-03	mg/kg-day	2.E-04
				Dinitrotoluene Mix	2.72E+00	mg/kg	1.90E-07	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	1.E-07	5.32E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	9.59E-06	mg/kg	6.70E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.E-07	1.88E-12	mg/kg-day	--	--	--
			Exp. Route Total								5.E-07					2.9.E-02
			Dermal Absorption	Aluminum	1.26E+04	mg/kg	2.91E-05	mg/kg-day	--	--	--	8.16E-05	mg/kg-day	1.00E+00	mg/kg-day	8.E-05
				Arsenic	1.49E+00	mg/kg	1.03E-08	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	2.E-08	2.89E-08	mg/kg-day	3.00E-04	mg/kg-day	1.E-04
				Chromium	2.05E+01	mg/kg	4.73E-08	mg/kg-day	--	--	--	1.32E-07	mg/kg-day	7.50E-05	mg/kg-day	2.E-03
				Cobalt	8.90E+00	mg/kg	2.05E-08	mg/kg-day	--	--	--	5.75E-08	mg/kg-day	2.00E-02	mg/kg-day	3.E-06
				Iron	2.04E+04	mg/kg	4.71E-05	mg/kg-day	--	--	--	1.32E-04	mg/kg-day	7.00E-01	mg/kg-day	2.E-04
				Manganese	5.99E+02	mg/kg	1.38E-06	mg/kg-day	--	--	--	3.87E-06	mg/kg-day	8.00E-04	mg/kg-day	5.E-03
				Vanadium	3.20E+01	mg/kg	7.38E-08	mg/kg-day	--	--	--	2.07E-07	mg/kg-day	2.60E-05	mg/kg-day	8.E-03
				Heptachlor epoxide	2.30E-02	mg/kg	5.30E-10	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	5.E-09	1.49E-09	mg/kg-day	1.30E-05	mg/kg-day	1.E-04
				Aroclor 1254	7.50E-03	mg/kg	2.42E-10	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-10	6.78E-10	mg/kg-day	2.00E-05	mg/kg-day	3.E-05
				2-Nitroaniline	2.80E-02	mg/kg	6.46E-10	mg/kg-day	--	--	--	1.81E-09	mg/kg-day	3.00E-03	mg/kg-day	6.E-07
				Di-n-octylphthalate	2.26E-01	mg/kg	5.21E-09	mg/kg-day	--	--	--	1.46E-08	mg/kg-day	4.00E-02	mg/kg-day	4.E-07
				Benzo(a)pyrene	1.55E-02	mg/kg	4.65E-10	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	3.E-09	1.30E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	2.11E-02	mg/kg	6.33E-10	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	5.E-09	1.77E-09	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	8.16E-02	mg/kg	2.45E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	2.E-09	6.85E-09	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	1.36E+01	mg/kg	9.41E-08	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	3.E-09	2.63E-07	mg/kg-day	5.00E-04	mg/kg-day	5.E-04
				2,4-Dinitrotoluene	1.65E+00	mg/kg	3.81E-08	mg/kg-day	--	--	--	1.07E-07	mg/kg-day	2.00E-03	mg/kg-day	5.E-05
				2,6-Dinitrotoluene	1.13E+00	mg/kg	2.61E-08	mg/kg-day	--	--	--	7.30E-08	mg/kg-day	1.00E-03	mg/kg-day	7.E-05
				Dinitrotoluene Mix	2.72E+00	mg/kg	6.27E-08	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	4.E-08	1.76E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	9.59E-06	mg/kg	6.64E-14	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.E-08	1.86E-13	mg/kg-day	--	--	--
			Exp. Route Total								9.E-08					1.6.E-02
		Exposure Point Total									5.E-07					4.E-02
	Exposure Medium Total										5.E-07					4.E-02

TABLE E.1-7.1.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	1.26E+04	mg/kg	8.03E-08	mg/kg-day	--	--	--	2.25E-07	mg/kg-day	1.00E-03	mg/kg-day	2.E-04
				Arsenic	1.49E+00	mg/kg	9.47E-12	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	1.E-10	2.65E-11	mg/kg-day	--	--	--
				Chromium	2.05E+01	mg/kg	1.30E-10	mg/kg-day	4.20E+01	mg/kg-day $^{-1}$	5.E-09	3.65E-10	mg/kg-day	3.00E-05	mg/kg-day	1.E-05
				Cobalt	8.90E+00	mg/kg	5.65E-11	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	6.E-10	1.58E-10	mg/kg-day	5.70E-06	mg/kg-day	3.E-05
				Iron	2.04E+04	mg/kg	1.30E-07	mg/kg-day	--	--	--	3.63E-07	mg/kg-day	--	--	--
				Manganese	5.99E+02	mg/kg	3.81E-09	mg/kg-day	--	--	--	1.07E-08	mg/kg-day	1.40E-05	mg/kg-day	8.E-04
				Vanadium	3.20E+01	mg/kg	2.03E-10	mg/kg-day	--	--	--	5.69E-10	mg/kg-day	--	--	--
				Heptachlor epoxide	2.30E-02	mg/kg	1.46E-13	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	1.E-12	4.09E-13	mg/kg-day	--	--	--
				Aroclor 1254	7.50E-03	mg/kg	4.77E-14	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-13	1.33E-13	mg/kg-day	--	--	--
				2-Nitroaniline	2.80E-02	mg/kg	1.78E-13	mg/kg-day	--	--	--	4.98E-13	mg/kg-day	2.90E-05	mg/kg-day	2.E-08
				Di-n-octylphthalate	2.26E-01	mg/kg	1.44E-12	mg/kg-day	--	--	--	4.02E-12	mg/kg-day	--	--	--
				Benzo(a)pyrene	1.55E-02	mg/kg	9.85E-14	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	3.E-13	2.76E-13	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	2.11E-02	mg/kg	1.34E-13	mg/kg-day	--	--	--	3.75E-13	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	8.16E-02	mg/kg	5.18E-13	mg/kg-day	--	--	--	1.45E-12	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	1.36E+01	mg/kg	8.64E-11	mg/kg-day	--	--	--	2.42E-10	mg/kg-day	--	--	--
				2,4-Dinitrotoluene	1.65E+00	mg/kg	1.05E-11	mg/kg-day	--	--	--	2.94E-11	mg/kg-day	--	--	--
				2,6-Dinitrotoluene	1.13E+00	mg/kg	7.18E-12	mg/kg-day	--	--	--	2.01E-11	mg/kg-day	--	--	--
				Dinitrotoluene Mix	2.72E+00	mg/kg	1.73E-11	mg/kg-day	--	--	--	4.84E-11	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	9.59E-06	mg/kg	6.09E-17	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	9.E-12	1.71E-16	mg/kg-day	--	--	--
			Exp. Route Total								6.E-09					1.E-03
		Exposure Point Total									6.E-09					1.E-03
	Exposure Medium Total										6.E-09					1.E-03
Soil Total											5.E-07					5.E-02
											Total of Receptor Risks Across All Media 5.E-07					Total of Receptor Hazards Across All Media 5.E-02

TABLE E.1-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	12227	mg/kg	2.14E-03	mg/kg-day	--	--	--	5.98E-03	mg/kg-day	1.00E+00	mg/kg-day	6.E-03
				Antimony	0.87	mg/kg	1.52E-07	mg/kg-day	--	--	--	4.26E-07	mg/kg-day	4.00E-04	mg/kg-day	1.E-03
				Arsenic	1.32	mg/kg	2.31E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	3.E-07	6.46E-07	mg/kg-day	3.00E-04	mg/kg-day	2.E-03
				Chromium	19.7	mg/kg	3.44E-06	mg/kg-day	--	--	--	9.64E-06	mg/kg-day	3.00E-03	mg/kg-day	3.E-03
				Cobalt	8.79	mg/kg	1.54E-06	mg/kg-day	--	--	--	4.30E-06	mg/kg-day	2.00E-02	mg/kg-day	2.E-04
				Iron	19503	mg/kg	3.41E-03	mg/kg-day	--	--	--	9.54E-03	mg/kg-day	7.00E-01	mg/kg-day	1.4.E-02
				Manganese	552.4	mg/kg	9.65E-05	mg/kg-day	--	--	--	2.70E-04	mg/kg-day	2.00E-02	mg/kg-day	1.4.E-02
				Vanadium	29.6	mg/kg	5.17E-06	mg/kg-day	--	--	--	1.45E-05	mg/kg-day	1.00E-03	mg/kg-day	1.4.E-02
				Heptachlor epoxide	0.04598	mg/kg	8.03E-09	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	7.E-08	2.25E-08	mg/kg-day	1.30E-05	mg/kg-day	2.E-03
				Aroclor 1254	0.0463	mg/kg	8.09E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-08	2.27E-08	mg/kg-day	2.00E-05	mg/kg-day	1.E-03
				2-Nitroaniline	0.0233	mg/kg	4.07E-09	mg/kg-day	--	--	--	1.14E-08	mg/kg-day	3.00E-03	mg/kg-day	4.E-06
				Di-n-octylphthalate	0.385	mg/kg	6.73E-08	mg/kg-day	--	--	--	1.88E-07	mg/kg-day	4.00E-02	mg/kg-day	5.E-06
				Benzo(a)anthracene	0.0409	mg/kg	7.15E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	5.E-09	2.00E-08	mg/kg-day	--	--	–
				Benzo(a)pyrene	0.146	mg/kg	2.55E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	2.E-07	7.14E-08	mg/kg-day	--	--	–
				Benzo(b)fluoranthene	0.0736	mg/kg	1.29E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	9.E-09	3.60E-08	mg/kg-day	--	--	–
				Dibenz(a,h)anthracene	0.0922	mg/kg	1.61E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.E-07	4.51E-08	mg/kg-day	--	--	–
				Indeno(1,2,3-cd)pyrene	0.0667	mg/kg	1.17E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	9.E-09	3.26E-08	mg/kg-day	--	--	–
				2,4,6-Trinitrotoluene	7.217	mg/kg	1.26E-06	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	4.E-08	3.53E-06	mg/kg-day	5.00E-04	mg/kg-day	7.E-03
				2,4-Dinitrotoluene	1.247	mg/kg	2.18E-07	mg/kg-day	--	--	--	6.10E-07	mg/kg-day	2.00E-03	mg/kg-day	3.E-04
				2,6-Dinitrotoluene	2.274	mg/kg	3.97E-07	mg/kg-day	--	--	--	1.11E-06	mg/kg-day	1.00E-03	mg/kg-day	1.E-03
				Dinitrotoluene Mix	1.91	mg/kg	3.34E-07	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	2.E-07	9.34E-07	mg/kg-day	--	--	–
				Nitroglycerin	2.36	mg/kg	4.12E-07	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	7.E-09	1.15E-06	mg/kg-day	1.00E-04	mg/kg-day	1.2.E-02
				2,3,7,8-TCDD Equivalents	0.00000944	mg/kg	1.65E-12	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-07	4.62E-12	mg/kg-day	--	--	–
			Exp. Route Total								1.E-06					8.E-02
			Dermal Absorption	Aluminum	12227	mg/kg	1.41E-04	mg/kg-day	--	--	--	3.95E-04	mg/kg-day	1.00E+00	mg/kg-day	4.E-04
				Antimony	0.87	mg/kg	1.00E-08	mg/kg-day	--	--	--	2.81E-08	mg/kg-day	6.00E-05	mg/kg-day	5.E-04
				Arsenic	1.32	mg/kg	4.57E-08	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	7.E-08	1.28E-07	mg/kg-day	3.00E-04	mg/kg-day	4.E-04
				Chromium	19.7	mg/kg	2.27E-07	mg/kg-day	--	--	--	6.36E-07	mg/kg-day	7.50E-05	mg/kg-day	8.E-03
				Cobalt	8.79	mg/kg	1.01E-07	mg/kg-day	--	--	--	2.84E-07	mg/kg-day	2.00E-02	mg/kg-day	1.E-05
				Iron	19503	mg/kg	2.25E-04	mg/kg-day	--	--	--	6.30E-04	mg/kg-day	7.00E-01	mg/kg-day	9.E-04
				Manganese	552.4	mg/kg	6.37E-06	mg/kg-day	--	--	--	1.78E-05	mg/kg-day	8.00E-04	mg/kg-day	2.E-02
				Vanadium	29.6	mg/kg	3.41E-07	mg/kg-day	--	--	--	9.56E-07	mg/kg-day	2.60E-05	mg/kg-day	3.7.E-02
				Heptachlor epoxide	0.04598	mg/kg	5.30E-09	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	5.E-08	1.48E-08	mg/kg-day	1.30E-05	mg/kg-day	1.E-03
				Aroclor 1254	0.0463	mg/kg	7.48E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-08	2.09E-08	mg/kg-day	2.00E-05	mg/kg-day	1.E-03
				2-Nitroaniline	0.0233	mg/kg	2.69E-09	mg/kg-day	--	--	--	7.52E-09	mg/kg-day	3.00E-03	mg/kg-day	3.E-06
				Di-n-octylphthalate	0.385	mg/kg	4.44E-08	mg/kg-day	--	--	--	1.24E-07	mg/kg-day	4.00E-02	mg/kg-day	3.E-06
				Benzo(a)anthracene	0.0409	mg/kg	6.13E-09	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	4.E-09	1.72E-08	mg/kg-day	--	--	–
				Benzo(a)pyrene	0.146	mg/kg	2.19E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	2.E-07	6.13E-08	mg/kg-day	--	--	–
				Benzo(b)fluoranthene	0.0736	mg/kg	1.10E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	8.E-09	3.09E-08	mg/kg-day	--	--	–
				Dibenz(a,h)anthracene	0.0922	mg/kg	1.38E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.E-07	3.87E-08	mg/kg-day	--	--	–
				Indeno(1,2,3-cd)pyrene	0.0667	mg/kg	1.00E-08	mg/kg-day	7.30E-01	mg/kg-day $^{-1}$	7.E-09	2.80E-08	mg/kg-day	--	--	–

TABLE E.1-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Soil Cont.	Soil Cont.		2,4,6-Trinitrotoluene	7.217	mg/kg	2.50E-07	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	7.E-09	6.99E-07	mg/kg-day	5.00E-04	mg/kg-day	1.E-03
				2,4-Dinitrotoluene	1.247	mg/kg	1.44E-07	mg/kg-day	--	--	--	4.03E-07	mg/kg-day	2.00E-03	mg/kg-day	2.E-04
				2,6-Dinitrotoluene	2.274	mg/kg	2.62E-07	mg/kg-day	--	--	--	7.34E-07	mg/kg-day	1.00E-03	mg/kg-day	7.E-04
				Dinitrotoluene Mix	1.91	mg/kg	2.20E-07	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	1.E-07	6.17E-07	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	2.72E-08	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	5.E-10	7.62E-08	mg/kg-day	1.00E-04	mg/kg-day	8.E-04
				2,3,7,8-TCDD Equivalents	0.00000944	mg/kg	3.27E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	5.E-08	9.14E-13	mg/kg-day	--	--	--
			Exp. Route Total								6.E-07					8.E-02
		Exposure Point Total									2.E-06					2.E-01
	Exposure Medium Total										2.E-06					2.E-01
	Air	Fugitive Dust	Inhalation	Aluminum	12227	mg/kg	5.03E-07	mg/kg-day	--	--	--	1.41E-06	mg/kg-day	1.00E-03	mg/kg-day	1.E-03
				Antimony	0.87	mg/kg	3.58E-11	mg/kg-day	--	--	--	1.00E-10	mg/kg-day	--	--	--
				Arsenic	1.32	mg/kg	5.43E-11	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	8.E-10	1.52E-10	mg/kg-day	--	--	--
				Chromium	19.7	mg/kg	8.10E-10	mg/kg-day	4.20E+01	mg/kg-day $^{-1}$	3.4.E-08	2.27E-09	mg/kg-day	3.00E-05	mg/kg-day	8.E-05
				Cobalt	8.79	mg/kg	3.61E-10	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	4.E-09	1.01E-09	mg/kg-day	5.70E-06	mg/kg-day	2.E-04
				Iron	19503	mg/kg	8.02E-07	mg/kg-day	--	--	--	2.25E-06	mg/kg-day	--	--	--
				Manganese	552.4	mg/kg	2.27E-08	mg/kg-day	--	--	--	6.36E-08	mg/kg-day	1.40E-05	mg/kg-day	5.E-03
				Vanadium	29.6	mg/kg	1.22E-09	mg/kg-day	--	--	--	3.41E-09	mg/kg-day	--	--	--
				Heptachlor epoxide	0.04598	mg/kg	1.89E-12	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	2.E-11	5.29E-12	mg/kg-day	--	--	--
				Aroclor 1254	0.0463	mg/kg	1.90E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-12	5.33E-12	mg/kg-day	--	--	--
				2-Nitroaniline	0.0233	mg/kg	9.58E-13	mg/kg-day	--	--	--	2.68E-12	mg/kg-day	2.90E-05	mg/kg-day	9.E-08
				Di-n-octylphthalate	0.385	mg/kg	1.58E-11	mg/kg-day	--	--	--	4.43E-11	mg/kg-day	--	--	--
				Benzo(a)anthracene	0.0409	mg/kg	1.68E-12	mg/kg-day	--	--	--	4.71E-12	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.146	mg/kg	6.00E-12	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	2.E-11	1.68E-11	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.0736	mg/kg	3.03E-12	mg/kg-day	--	--	--	8.48E-12	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.0922	mg/kg	3.79E-12	mg/kg-day	--	--	--	1.06E-11	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	0.0667	mg/kg	2.74E-12	mg/kg-day	--	--	--	7.68E-12	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	7.217	mg/kg	2.97E-10	mg/kg-day	--	--	--	8.31E-10	mg/kg-day	--	--	--
				2,4-Dinitrotoluene	1.247	mg/kg	5.13E-11	mg/kg-day	--	--	--	1.44E-10	mg/kg-day	--	--	--
				2,6-Dinitrotoluene	2.274	mg/kg	9.35E-11	mg/kg-day	--	--	--	2.62E-10	mg/kg-day	--	--	--
				Dinitrotoluene Mix	1.91	mg/kg	7.85E-11	mg/kg-day	--	--	--	2.20E-10	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	9.71E-11	mg/kg-day	--	--	--	2.72E-10	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	0.00000944	mg/kg	3.88E-16	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	6.E-11	1.09E-15	mg/kg-day	--	--	--
			Exp. Route Total								4.E-08					6.E-03
		Exposure Point Total									4.E-08					6.E-03
	Exposure Medium Total										4.E-08					6.E-03
Soil Total											2.E-06					2.E-01

TABLE E.1-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Cobalt	2.4	ug/L	8.39E-06	mg/kg-day	--	--	--	2.35E-05	mg/kg-day	4.00E-04	mg/kg-day	6.E-02
				Manganese	190.5	ug/L	6.66E-04	mg/kg-day	--	--	--	1.86E-03	mg/kg-day	2.00E-02	mg/kg-day	9.E-02
				2,4,6-Trinitrotoluene	17	ug/L	5.94E-05	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	1.8.E-06	1.66E-04	mg/kg-day	5.00E-04	mg/kg-day	3.E-01
				Dinitrotoluene Mixture	0.65	ug/L	2.27E-06	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	1.5.E-06	6.36E-06	mg/kg-day	--	--	--
				RDX	8	ug/L	2.80E-05	mg/kg-day	1.10E-01	mg/kg-day $^{-1}$	3.1.E-06	7.83E-05	mg/kg-day	3.00E-03	mg/kg-day	3.E-02
				Perchlorate	2	ug/L	6.99E-06	mg/kg-day	--	--	--	1.96E-05	mg/kg-day	7.00E-04	mg/kg-day	3.E-02
			Exp. Route Total								6.E-06					5.E-01
			Dermal Absorption	Cobalt	2.4	ug/L	6.71E-09	mg/kg-day	--	--	--	1.88E-08	mg/kg-day	6.00E-05	mg/kg-day	3.E-04
				Manganese	190.5	ug/L	5.33E-07	mg/kg-day	--	--	--	1.49E-06	mg/kg-day	8.00E-04	mg/kg-day	2.E-03
				2,4,6-Trinitrotoluene	17	ug/L	1.97E-07	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	6.E-09	5.52E-07	mg/kg-day	5.00E-04	mg/kg-day	1.E-03
				Dinitrotoluene Mixture	0.65	ug/L	1.63E-08	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	1.E-08	4.57E-08	mg/kg-day	--	--	--
				RDX	8	ug/L	2.93E-08	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	9.E-10	8.20E-08	mg/kg-day	3.00E-03	mg/kg-day	3.E-05
				Perchlorate	2	ug/L	5.59E-09	mg/kg-day	--	--	--	1.57E-08	mg/kg-day	7.00E-04	mg/kg-day	2.E-05
			Exp. Route Total								2.E-08					3.E-03
		Exposure Point Total									6.E-06					5.E-01
	Exposure Medium Total										6.E-06					5.E-01
Groundwater Total											6.E-06					5.E-01
											Total of Receptor Risks Across All Media	8.E-06	Total of Receptor Hazards Across All Media			7.E-01

TABLE E.1-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	12227	mg/kg	5.64E-04	mg/kg-day	--	--	--	3.95E-02	mg/kg-day	1.00E+00	mg/kg-day	4.E-02
				Antimony	0.87	mg/kg	4.01E-08	mg/kg-day	--	--	--	2.81E-06	mg/kg-day	2.00E-04	mg/kg-day	1.E-02
				Arsenic	1.32	mg/kg	6.09E-08	mg/kg-day	1.50E+00	mg/kg-day^{-1}	9.E-08	4.26E-06	mg/kg-day	3.00E-04	mg/kg-day	1.E-02
				Chromium	19.7	mg/kg	9.09E-07	mg/kg-day	--	--	--	6.36E-05	mg/kg-day	2.00E-02	mg/kg-day	3.E-03
				Cobalt	8.79	mg/kg	4.05E-07	mg/kg-day	--	--	--	2.84E-05	mg/kg-day	2.00E-02	mg/kg-day	1.E-03
				Iron	19503	mg/kg	9.00E-04	mg/kg-day	--	--	--	6.30E-02	mg/kg-day	7.00E-01	mg/kg-day	9.E-02
				Manganese	552.4	mg/kg	2.55E-05	mg/kg-day	--	--	--	1.78E-03	mg/kg-day	2.00E-02	mg/kg-day	9.E-02
				Vanadium	29.6	mg/kg	1.37E-06	mg/kg-day	--	--	--	9.56E-05	mg/kg-day	7.00E-03	mg/kg-day	1.E-02
				Heptachlor epoxide	0.04598	mg/kg	2.12E-09	mg/kg-day	9.10E+00	mg/kg-day^{-1}	2.E-08	1.48E-07	mg/kg-day	1.30E-05	mg/kg-day	1.E-02
				Aroclor 1254	0.0463	mg/kg	2.14E-09	mg/kg-day	2.00E+00	mg/kg-day^{-1}	4.E-09	1.50E-07	mg/kg-day	5.00E-05	mg/kg-day	3.E-03
				2-Nitroaniline	0.0233	mg/kg	1.07E-09	mg/kg-day	--	--	--	7.52E-08	mg/kg-day	3.00E-03	mg/kg-day	3.E-05
				Di-n-octylphthalate	0.385	mg/kg	1.78E-08	mg/kg-day	--	--	--	1.24E-06	mg/kg-day	4.00E-01	mg/kg-day	3.E-06
				Benzo(a)anthracene	0.0409	mg/kg	1.89E-09	mg/kg-day	7.30E-01	mg/kg-day^{-1}	1.E-09	1.32E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.146	mg/kg	6.73E-09	mg/kg-day	7.30E+00	mg/kg-day^{-1}	5.E-08	4.71E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.0736	mg/kg	3.40E-09	mg/kg-day	7.30E-01	mg/kg-day^{-1}	2.E-09	2.38E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.0922	mg/kg	4.25E-09	mg/kg-day	7.30E+00	mg/kg-day^{-1}	3.E-08	2.98E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	0.0667	mg/kg	3.08E-09	mg/kg-day	7.30E-01	mg/kg-day^{-1}	2.E-09	2.15E-07	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	7.217	mg/kg	3.33E-07	mg/kg-day	3.00E-02	mg/kg-day^{-1}	1.E-08	2.33E-05	mg/kg-day	5.00E-04	mg/kg-day	5.E-02
				2,4-Dinitrotoluene	1.247	mg/kg	5.75E-08	mg/kg-day	--	--	--	4.03E-06	mg/kg-day	2.00E-03	mg/kg-day	2.E-03
				2,6-Dinitrotoluene	2.274	mg/kg	1.05E-07	mg/kg-day	--	--	--	7.34E-06	mg/kg-day	1.00E-02	mg/kg-day	7.E-04
				Dinitrotoluene Mix	1.91	mg/kg	8.81E-08	mg/kg-day	6.80E-01	mg/kg-day^{-1}	6.E-08	6.17E-06	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	1.09E-07	mg/kg-day	1.70E-02	mg/kg-day^{-1}	2.E-09	7.62E-06	mg/kg-day	1.00E-04	mg/kg-day	8.E-02
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	4.35E-13	mg/kg-day	1.50E+05	mg/kg-day^{-1}	7.E-08	3.05E-11	mg/kg-day	--	--	--
			Exp. Route Total								3.E-07					4.E-01
			Dermal Absorption	Aluminum	12227	mg/kg	1.69E-05	mg/kg-day	--	--	--	1.18E-03	mg/kg-day	1.00E+00	mg/kg-day	1.E-03
				Antimony	0.87	mg/kg	1.20E-09	mg/kg-day	--	--	--	8.43E-08	mg/kg-day	3.00E-05	mg/kg-day	3.E-03
				Arsenic	1.32	mg/kg	5.48E-09	mg/kg-day	1.50E+00	mg/kg-day^{-1}	8.E-09	3.84E-07	mg/kg-day	3.00E-04	mg/kg-day	1.E-03
				Chromium	19.7	mg/kg	2.73E-08	mg/kg-day	--	--	--	1.91E-06	mg/kg-day	5.00E-04	mg/kg-day	4.E-03
				Cobalt	8.79	mg/kg	1.22E-08	mg/kg-day	--	--	--	8.51E-07	mg/kg-day	2.00E-02	mg/kg-day	4.E-05
				Iron	19503	mg/kg	2.70E-05	mg/kg-day	--	--	--	1.89E-03	mg/kg-day	7.00E-01	mg/kg-day	3.E-03
				Manganese	552.4	mg/kg	7.64E-07	mg/kg-day	--	--	--	5.35E-05	mg/kg-day	8.00E-04	mg/kg-day	7.E-02
				Vanadium	29.6	mg/kg	4.10E-08	mg/kg-day	--	--	--	2.87E-06	mg/kg-day	1.80E-04	mg/kg-day	2.E-02
				Heptachlor epoxide	0.04598	mg/kg	6.36E-10	mg/kg-day	9.10E+00	mg/kg-day^{-1}	6.E-09	4.45E-08	mg/kg-day	1.30E-05	mg/kg-day	3.E-03
				Aroclor 1254	0.0463	mg/kg	8.97E-10	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-09	6.28E-08	mg/kg-day	5.00E-05	mg/kg-day	1.E-03
				2-Nitroaniline	0.0233	mg/kg	3.22E-10	mg/kg-day	--	--	--	2.26E-08	mg/kg-day	3.00E-03	mg/kg-day	8.E-06
				Di-n-octylphthalate	0.385	mg/kg	5.33E-09	mg/kg-day	--	--	--	3.73E-07	mg/kg-day	4.00E-01	mg/kg-day	9.E-07
				Benzo(a)anthracene	0.0409	mg/kg	7.36E-10	mg/kg-day	7.30E-01	mg/kg-day^{-1}	5.E-10	5.15E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.146	mg/kg	2.63E-09	mg/kg-day	7.30E+00	mg/kg-day^{-1}	2.E-08	1.84E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.0736	mg/kg	1.32E-09	mg/kg-day	7.30E-01	mg/kg-day^{-1}	1.E-09	9.27E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.0922	mg/kg	1.66E-09	mg/kg-day	7.30E+00	mg/kg-day^{-1}	1.E-08	1.16E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	0.0667	mg/kg	1.20E-09	mg/kg-day	7.30E-01	mg/kg-day^{-1}	9.E-10	8.40E-08	mg/kg-day	--	--	--

TABLE E.1-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Soil Cont.	Soil Cont.		2,4,6-Trinitrotoluene	7.217	mg/kg	3.00E-08	mg/kg-day	3.00E-02	mg/kg-day^{-1}	9.E-10	2.10E-06	mg/kg-day	5.00E-04	mg/kg-day	4.E-03
				2,4-Dinitrotoluene	1.247	mg/kg	1.73E-08	mg/kg-day	--	--	--	1.21E-06	mg/kg-day	2.00E-03	mg/kg-day	6.E-04
				2,6-Dinitrotoluene	2.274	mg/kg	3.15E-08	mg/kg-day	--	--	--	2.20E-06	mg/kg-day	1.00E-02	mg/kg-day	2.E-04
				Dinitrotoluene Mix	1.91	mg/kg	2.64E-08	mg/kg-day	6.80E-01	mg/kg-day^{-1}	2.E-08	1.85E-06	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	3.27E-09	mg/kg-day	1.70E-02	mg/kg-day^{-1}	6.E-11	2.29E-07	mg/kg-day	1.00E-04	mg/kg-day	2.E-03
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	3.92E-14	mg/kg-day	1.50E+05	mg/kg-day^{-1}	6.E-09	2.74E-12	mg/kg-day	--	--	--
			Exp. Route Total								7.E-08					1.E-01
		Exposure Point Total									4.E-07					5.E-01
	Exposure Medium Total										4.E-07					5.E-01
	Air	Fugitive Dust	Inhalation	Aluminum	12227	mg/kg	2.84E-05	mg/kg-day	--	--	--	1.99E-03	mg/kg-day	1.00E-03	mg/kg-day	2.0.E+00
				Antimony	0.87	mg/kg	2.02E-09	mg/kg-day	--	--	--	1.42E-07	mg/kg-day	1.10E-04	mg/kg-day	1.E-03
				Arsenic	1.32	mg/kg	3.07E-09	mg/kg-day	1.50E+01	mg/kg-day^{-1}	5.E-08	2.15E-07	mg/kg-day	--	--	--
				Chromium	19.7	mg/kg	4.58E-08	mg/kg-day	4.20E+01	mg/kg-day^{-1}	2.E-06	3.21E-06	mg/kg-day	3.00E-05	mg/kg-day	1.E-01
				Cobalt	8.79	mg/kg	2.04E-08	mg/kg-day	9.80E+00	mg/kg-day^{-1}	2.E-07	1.43E-06	mg/kg-day	5.70E-06	mg/kg-day	3.E-01
				Iron	19503	mg/kg	4.54E-05	mg/kg-day	--	--	--	3.18E-03	mg/kg-day	--	--	--
				Manganese	552.4	mg/kg	1.28E-06	mg/kg-day	--	--	--	8.99E-05	mg/kg-day	1.40E-05	mg/kg-day	6.4.E+00
				Vanadium	29.6	mg/kg	6.88E-08	mg/kg-day	--	--	--	4.82E-06	mg/kg-day	--	--	--
				Heptachlor epoxide	0.04598	mg/kg	1.07E-10	mg/kg-day	9.10E+00	mg/kg-day^{-1}	1.E-09	7.49E-09	mg/kg-day	--	--	--
				Aroclor 1254	0.0463	mg/kg	1.08E-10	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-10	7.54E-09	mg/kg-day	--	--	--
				2-Nitroaniline	0.0233	mg/kg	5.42E-11	mg/kg-day	--	--	--	3.79E-09	mg/kg-day	2.90E-04	mg/kg-day	1.E-05
				Di-n-octylphthalate	0.385	mg/kg	8.95E-10	mg/kg-day	--	--	--	6.27E-08	mg/kg-day	--	--	--
				Benzo(a)anthracene	0.0409	mg/kg	9.51E-11	mg/kg-day	--	--	--	6.66E-09	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.146	mg/kg	3.40E-10	mg/kg-day	3.10E+00	mg/kg-day^{-1}	1.E-09	2.38E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.0736	mg/kg	1.71E-10	mg/kg-day	--	--	--	1.20E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.0922	mg/kg	2.14E-10	mg/kg-day	--	--	--	1.50E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene	0.0667	mg/kg	1.55E-10	mg/kg-day	--	--	--	1.09E-08	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	7.217	mg/kg	1.68E-08	mg/kg-day	--	--	--	1.17E-06	mg/kg-day	--	--	--
				2,4-Dinitrotoluene	1.247	mg/kg	2.90E-09	mg/kg-day	--	--	--	2.03E-07	mg/kg-day	--	--	--
				2,6-Dinitrotoluene	2.274	mg/kg	5.29E-09	mg/kg-day	--	--	--	3.70E-07	mg/kg-day	--	--	--
				Dinitrotoluene Mix	1.91	mg/kg	4.44E-09	mg/kg-day	--	--	--	3.11E-07	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	5.49E-09	mg/kg-day	--	--	--	3.84E-07	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	2.20E-14	mg/kg-day	1.50E+05	mg/kg-day^{-1}	3.E-09	1.54E-12	mg/kg-day	--	--	--
			Exp. Route Total								2.E-06					9.E+00
		Exposure Point Total									2.E-06					9.E+00
	Exposure Medium Total										2.E-06					9.E+00
Soil Total											3.E-06					9.E+00

TABLE E.1-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Groundwater	Groundwater	Ingestion	Cobalt	2.4	ug/L	3.35E-09	mg/kg-day	--	--	--	2.35E-07	mg/kg-day	2.00E-04	mg/kg-day	1.E-03
				Manganese	190.5	ug/L	2.66E-07	mg/kg-day	--	--	--	1.86E-05	mg/kg-day	2.00E-02	mg/kg-day	9.E-04
				2,4,6-Trinitrotoluene	17	ug/L	2.38E-08	mg/kg-day	3.00E-02	mg/kg-day^{-1}	7.E-10	1.66E-06	mg/kg-day	5.00E-04	mg/kg-day	3.E-03
				Dinitrotoluene Mixture	0.65	ug/L	9.09E-10	mg/kg-day	6.80E-01	mg/kg-day^{-1}	6.E-10	6.36E-08	mg/kg-day	--	--	--
				RDX	8	ug/L	1.12E-08	mg/kg-day	1.10E-01	mg/kg-day^{-1}	1.E-09	7.83E-07	mg/kg-day	3.00E-03	mg/kg-day	3.E-04
				Perchlorate	2	ug/L	2.80E-09	mg/kg-day	--	--	--	1.96E-07	mg/kg-day	7.00E-04	mg/kg-day	3.E-04
			Exp. Route Total								3.E-09					6.E-03
			Dermal Absorption	Cobalt	2.4	ug/L	2.21E-09	mg/kg-day	--	--	--	1.55E-07	mg/kg-day	3.00E-05	mg/kg-day	5.E-03
				Manganese	190.5	ug/L	1.76E-07	mg/kg-day	--	--	--	1.23E-05	mg/kg-day	8.00E-04	mg/kg-day	1.5.E-02
				2,4,6-Trinitrotoluene	17	ug/L	3.25E-08	mg/kg-day	3.00E-02	mg/kg-day^{-1}	1.E-09	2.28E-06	mg/kg-day	5.00E-04	mg/kg-day	5.E-03
				Dinitrotoluene Mixture	0.65	ug/L	2.87E-09	mg/kg-day	6.80E-01	mg/kg-day^{-1}	2.E-09	2.01E-07	mg/kg-day	--	--	--
				RDX	8	ug/L	4.83E-09	mg/kg-day	3.00E-02	mg/kg-day^{-1}	1.E-10	3.38E-07	mg/kg-day	3.00E-03	mg/kg-day	1.E-04
				Perchlorate	2	ug/L	1.85E-09	mg/kg-day	--	--	--	1.29E-07	mg/kg-day	7.00E-04	mg/kg-day	2.E-04
			Exp. Route Total								3.E-09					3.E-02
		Exposure Point Total									6.E-09					3.E-02
	Exposure Medium Total										6.E-09					3.E-02
Groundwater Total											6.E-09					3.E-02
											Total of Receptor Risks Across All Media	3.E-06	Total of Receptor Hazards Across All Media			9.E+00

TABLE E.1-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	12227	mg/kg	5.74E-03	mg/kg-day	--	--	--	1.67E-02	mg/kg-day	1.00E+00	mg/kg-day	2.E-02
				Antimony	0.87	mg/kg	4.09E-07	mg/kg-day	--	--	--	1.19E-06	mg/kg-day	4.00E-04	mg/kg-day	3.E-03
				Arsenic	1.32	mg/kg	6.20E-07	mg/kg-day	1.50E+00	mg/kg-day^{-1}	9.E-07	1.81E-06	mg/kg-day	3.00E-04	mg/kg-day	6.E-03
				Chromium	19.7	mg/kg	9.25E-06	mg/kg-day	--	--	--	2.70E-05	mg/kg-day	3.00E-03	mg/kg-day	9.E-03
				Cobalt	8.79	mg/kg	4.13E-06	mg/kg-day	--	--	--	1.20E-05	mg/kg-day	2.00E-02	mg/kg-day	6.E-04
				Iron	19503	mg/kg	9.16E-03	mg/kg-day	--	--	--	2.67E-02	mg/kg-day	7.00E-01	mg/kg-day	4.E-02
				Manganese	552.4	mg/kg	2.59E-04	mg/kg-day	--	--	--	7.57E-04	mg/kg-day	2.00E-02	mg/kg-day	4.E-02
				Vanadium	29.6	mg/kg	1.39E-05	mg/kg-day	--	--	--	4.05E-05	mg/kg-day	1.00E-03	mg/kg-day	4.E-02
				Heptachlor epoxide	0.04598	mg/kg	2.16E-08	mg/kg-day	9.10E+00	mg/kg-day^{-1}	2.E-07	6.30E-08	mg/kg-day	1.30E-05	mg/kg-day	5.E-03
				Aroclor 1254	0.0463	mg/kg	2.17E-08	mg/kg-day	2.00E+00	mg/kg-day^{-1}	4.E-08	6.34E-08	mg/kg-day	2.00E-05	mg/kg-day	3.E-03
				2-Nitroaniline	0.0233	mg/kg	1.09E-08	mg/kg-day	--	--	--	3.19E-08	mg/kg-day	3.00E-03	mg/kg-day	1.E-05
				Di-n-octylphthalate	0.385	mg/kg	1.81E-07	mg/kg-day	--	--	--	5.27E-07	mg/kg-day	4.00E-02	mg/kg-day	1.E-05
				Benzo(a)anthracene*	0.0409	mg/kg	1.92E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	3.E-08	5.60E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.146	mg/kg	6.86E-08	mg/kg-day	7.30E+00	mg/kg-day^{-1}	9.E-07	2.00E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.0736	mg/kg	3.46E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	5.E-08	1.01E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.0922	mg/kg	4.33E-08	mg/kg-day	7.30E+00	mg/kg-day^{-1}	6.E-07	1.26E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene*	0.0667	mg/kg	3.13E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	4.E-08	9.14E-08	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	7.217	mg/kg	3.39E-06	mg/kg-day	3.00E-02	mg/kg-day^{-1}	1.E-07	9.89E-06	mg/kg-day	5.00E-04	mg/kg-day	2.E-02
				2,4-Dinitrotoluene	1.247	mg/kg	5.86E-07	mg/kg-day	--	--	--	1.71E-06	mg/kg-day	2.00E-03	mg/kg-day	9.E-04
				2,6-Dinitrotoluene	2.274	mg/kg	1.07E-06	mg/kg-day	--	--	--	3.12E-06	mg/kg-day	1.00E-03	mg/kg-day	3.E-03
				Dinitrotoluene Mix	1.91	mg/kg	8.97E-07	mg/kg-day	6.80E-01	mg/kg-day^{-1}	6.E-07	2.62E-06	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	1.11E-06	mg/kg-day	1.70E-02	mg/kg-day^{-1}	2.E-08	3.23E-06	mg/kg-day	1.00E-04	mg/kg-day	3.E-02
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	4.43E-12	mg/kg-day	1.50E+05	mg/kg-day^{-1}	7.E-07	1.29E-11	mg/kg-day	--	--	--
			Exp. Route Total								4.E-06					2.E-01
			Dermal Absorption	Aluminum	12227	mg/kg	2.29E-04	mg/kg-day	--	--	--	6.68E-04	mg/kg-day	1.00E+00	mg/kg-day	7.E-04
				Antimony	0.87	mg/kg	1.63E-08	mg/kg-day	--	--	--	4.76E-08	mg/kg-day	6.00E-05	mg/kg-day	8.E-04
				Arsenic	1.32	mg/kg	7.42E-08	mg/kg-day	1.50E+00	mg/kg-day^{-1}	1.E-07	2.16E-07	mg/kg-day	3.00E-04	mg/kg-day	7.E-04
				Chromium	19.7	mg/kg	3.69E-07	mg/kg-day	--	--	--	1.08E-06	mg/kg-day	7.50E-05	mg/kg-day	1.E-02
				Cobalt	8.79	mg/kg	1.65E-07	mg/kg-day	--	--	--	4.80E-07	mg/kg-day	2.00E-02	mg/kg-day	2.E-05
				Iron	19503	mg/kg	3.65E-04	mg/kg-day	--	--	--	1.07E-03	mg/kg-day	7.00E-01	mg/kg-day	2.E-03
				Manganese	552.4	mg/kg	1.04E-05	mg/kg-day	--	--	--	3.02E-05	mg/kg-day	8.00E-04	mg/kg-day	4.E-02
				Vanadium	29.6	mg/kg	5.55E-07	mg/kg-day	--	--	--	1.62E-06	mg/kg-day	2.60E-05	mg/kg-day	6.E-02
				Heptachlor epoxide	0.04598	mg/kg	8.62E-09	mg/kg-day	9.10E+00	mg/kg-day^{-1}	8.E-08	2.51E-08	mg/kg-day	1.30E-05	mg/kg-day	2.E-03
				Aroclor 1254	0.0463	mg/kg	1.21E-08	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-08	3.54E-08	mg/kg-day	2.00E-05	mg/kg-day	2.E-03
				2-Nitroaniline	0.0233	mg/kg	4.37E-09	mg/kg-day	--	--	--	1.27E-08	mg/kg-day	3.00E-03	mg/kg-day	4.E-06
				Di-n-octylphthalate	0.385	mg/kg	7.21E-08	mg/kg-day	--	--	--	2.10E-07	mg/kg-day	4.00E-02	mg/kg-day	5.E-06
				Benzo(a)anthracene*	0.0409	mg/kg	9.96E-09	mg/kg-day	7.30E-01	mg/kg-day^{-1}	1.E-08	2.91E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.146	mg/kg	3.56E-08	mg/kg-day	7.30E+00	mg/kg-day^{-1}	5.E-07	1.04E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.0736	mg/kg	1.79E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	2.E-08	5.23E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.0922	mg/kg	2.25E-08	mg/kg-day	7.30E+00	mg/kg-day^{-1}	3.E-07	6.55E-08	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene*	0.0667	mg/kg	1.62E-08	mg/kg-day	7.30E-01	mg/kg-day^{-1}	2.E-08	4.74E-08	mg/kg-day	--	--	--

TABLE E.1-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Soil Cont.	Soil Cont.		2,4,6-Trinitrotoluene	7.217	mg/kg	4.06E-07	mg/kg-day	3.00E-02	mg/kg-day^{-1}	1.E-08	1.18E-06	mg/kg-day	5.00E-04	mg/kg-day	2.E-03
				2,4-Dinitrotoluene	1.247	mg/kg	2.34E-07	mg/kg-day	--	--	--	6.82E-07	mg/kg-day	2.00E-03	mg/kg-day	3.E-04
				2,6-Dinitrotoluene	2.274	mg/kg	4.26E-07	mg/kg-day	--	--	--	1.24E-06	mg/kg-day	1.00E-03	mg/kg-day	1.E-03
				Dinitrotoluene Mix	1.91	mg/kg	3.58E-07	mg/kg-day	6.80E-01	mg/kg-day^{-1}	2.E-07	1.04E-06	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	4.42E-08	mg/kg-day	1.70E-02	mg/kg-day^{-1}	8.E-10	1.29E-07	mg/kg-day	1.00E-04	mg/kg-day	1.E-03
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	5.31E-13	mg/kg-day	1.50E+05	mg/kg-day^{-1}	8.E-08	1.55E-12	mg/kg-day	--	--	--
			Exp. Route Total								1.E-06					1.E-01
		Exposure Point Total									6.E-06					3.E-01
	Exposure Medium Total										6.E-06					3.E-01
	Air	Fugitive Dust	Inhalation	Aluminum	12227	mg/kg	1.06E-07	mg/kg-day	--	--	--	3.10E-07	mg/kg-day	1.00E-03	mg/kg-day	3.E-04
				Antimony	0.87	mg/kg	7.57E-12	mg/kg-day	--	--	--	2.21E-11	mg/kg-day	--	--	--
				Arsenic	1.32	mg/kg	1.15E-11	mg/kg-day	1.50E+01	mg/kg-day^{-1}	2.E-10	3.35E-11	mg/kg-day	--	--	--
				Chromium	19.7	mg/kg	1.71E-10	mg/kg-day	4.20E+01	mg/kg-day^{-1}	7.E-09	5.00E-10	mg/kg-day	3.00E-05	mg/kg-day	2.E-05
				Cobalt	8.79	mg/kg	7.65E-11	mg/kg-day	9.80E+00	mg/kg-day^{-1}	7.E-10	2.23E-10	mg/kg-day	5.70E-06	mg/kg-day	4.E-05
				Iron	19503	mg/kg	1.70E-07	mg/kg-day	--	--	--	4.95E-07	mg/kg-day	--	--	--
				Manganese	552.4	mg/kg	4.81E-09	mg/kg-day	--	--	--	1.40E-08	mg/kg-day	1.40E-05	mg/kg-day	1.E-03
				Vanadium	29.6	mg/kg	2.58E-10	mg/kg-day	--	--	--	7.52E-10	mg/kg-day	--	--	--
				Heptachlor epoxide	0.04598	mg/kg	4.00E-13	mg/kg-day	9.10E+00	mg/kg-day^{-1}	4.E-12	1.17E-12	mg/kg-day	--	--	--
				Aroclor 1254	0.0463	mg/kg	4.03E-13	mg/kg-day	2.00E+00	mg/kg-day^{-1}	8.E-13	1.18E-12	mg/kg-day	--	--	--
				2-Nitroaniline	0.0233	mg/kg	2.03E-13	mg/kg-day	--	--	--	5.92E-13	mg/kg-day	2.90E-05	mg/kg-day	2.E-08
				Di-n-octylphthalate	0.385	mg/kg	3.35E-12	mg/kg-day	--	--	--	9.78E-12	mg/kg-day	--	--	--
				Benzo(a)anthracene*	0.0409	mg/kg	3.56E-13	mg/kg-day	--	--	--	1.04E-12	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.146	mg/kg	1.27E-12	mg/kg-day	3.10E+00	mg/kg-day^{-1}	7.E-12	3.71E-12	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.0736	mg/kg	6.41E-13	mg/kg-day	--	--	--	1.87E-12	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.0922	mg/kg	8.03E-13	mg/kg-day	--	--	--	2.34E-12	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene*	0.0667	mg/kg	5.81E-13	mg/kg-day	--	--	--	1.69E-12	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	7.217	mg/kg	6.28E-11	mg/kg-day	--	--	--	1.83E-10	mg/kg-day	--	--	--
				2,4-Dinitrotoluene	1.247	mg/kg	1.09E-11	mg/kg-day	--	--	--	3.17E-11	mg/kg-day	--	--	--
				2,6-Dinitrotoluene	2.274	mg/kg	1.98E-11	mg/kg-day	--	--	--	5.77E-11	mg/kg-day	--	--	--
				Dinitrotoluene Mix	1.91	mg/kg	1.66E-11	mg/kg-day	--	--	--	4.85E-11	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	2.05E-11	mg/kg-day	--	--	--	5.99E-11	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	8.22E-17	mg/kg-day	1.50E+05	mg/kg-day^{-1}	1.E-11	2.40E-16	mg/kg-day	--	--	--
			Exp. Route Total								8.E-09					1.E-03
		Exposure Point Total									8.E-09					1.E-03
	Exposure Medium Total										8.E-09					1.E-03
Soil Total											6.E-06					3.E-01

TABLE E.1-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Cobalt	2.4	ug/L	2.25E-05	mg/kg-day	--	--	--	6.58E-05	mg/kg-day	4.00E-04	mg/kg-day	2.E-01
				Manganese	190.5	ug/L	1.79E-03	mg/kg-day	--	--	--	5.22E-03	mg/kg-day	2.00E-02	mg/kg-day	3.E-01
				2,4,6-Trinitrotoluene	17	ug/L	1.60E-04	mg/kg-day	3.00E-02	mg/kg-day^{-1}	5.E-06	4.66E-04	mg/kg-day	5.00E-04	mg/kg-day	9.E-01
				Dinitrotoluene Mixture	0.65	ug/L	6.11E-06	mg/kg-day	6.80E-01	mg/kg-day^{-1}	4.E-06	1.78E-05	mg/kg-day	--	--	--
				RDX	8	ug/L	7.51E-05	mg/kg-day	1.10E-01	mg/kg-day^{-1}	8.E-06	2.19E-04	mg/kg-day	3.00E-03	mg/kg-day	7.E-02
				Perchlorate	2	ug/L	1.88E-05	mg/kg-day	--	--	--	5.48E-05	mg/kg-day	7.00E-04	mg/kg-day	8.E-02
			Exp. Route Total								1.7.E-05					1.5.E+00
			Dermal Absorption	Cobalt	2.4	ug/L	1.18E-07	mg/kg-day	--	--	--	3.43E-07	mg/kg-day	6.00E-05	mg/kg-day	6.E-03
				Manganese	190.5	ug/L	9.34E-06	mg/kg-day	--	--	--	2.72E-05	mg/kg-day	8.00E-04	mg/kg-day	3.E-02
				2,4,6-Trinitrotoluene	17	ug/L	4.54E-06	mg/kg-day	3.00E-02	mg/kg-day^{-1}	1.E-07	1.32E-05	mg/kg-day	5.00E-04	mg/kg-day	3.E-02
				Dinitrotoluene Mixture	0.65	ug/L	3.76E-07	mg/kg-day	6.80E-01	mg/kg-day^{-1}	3.E-07	1.10E-06	mg/kg-day	--	--	--
				RDX	8	ug/L	6.74E-07	mg/kg-day	3.00E-02	mg/kg-day^{-1}	2.E-08	1.97E-06	mg/kg-day	3.00E-03	mg/kg-day	7.E-04
				Perchlorate	2	ug/L	9.81E-08	mg/kg-day	--	--	--	2.86E-07	mg/kg-day	7.00E-04	mg/kg-day	4.E-04
			Exp. Route Total								4.E-07					7.E-02
		Exposure Point Total									2.E-05					1.6.E+00
	Exposure Medium Total										2.E-05					1.6.E+00
Groundwater Total											2.E-05					1.6.E+00
											Total of Receptor Risks Across All Media					2.E+00

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.1-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	12227	mg/kg	1.34E-02	mg/kg-day	--	--	--	1.56E-01	mg/kg-day	1.00E+00	mg/kg-day	1.6.E-01
				Antimony	0.87	mg/kg	9.53E-07	mg/kg-day	--	--	--	1.11E-05	mg/kg-day	4.00E-04	mg/kg-day	3.E-02
				Arsenic	1.32	mg/kg	1.45E-06	mg/kg-day	1.50E+00	$mg/kg\text{-}day^{-1}$	2.E-06	1.69E-05	mg/kg-day	3.00E-04	mg/kg-day	6.E-02
				Chromium	19.7	mg/kg	2.16E-05	mg/kg-day	--	--	--	2.52E-04	mg/kg-day	3.00E-03	mg/kg-day	8.E-02
				Cobalt	8.79	mg/kg	9.63E-06	mg/kg-day	--	--	--	1.12E-04	mg/kg-day	2.00E-02	mg/kg-day	6.E-03
				Iron	19503	mg/kg	2.14E-02	mg/kg-day	--	--	--	2.49E-01	mg/kg-day	7.00E-01	mg/kg-day	3.6.E-01
				Manganese	552.4	mg/kg	6.05E-04	mg/kg-day	--	--	--	7.06E-03	mg/kg-day	2.00E-02	mg/kg-day	3.5.E-01
				Vanadium	29.6	mg/kg	3.24E-05	mg/kg-day	--	--	--	3.78E-04	mg/kg-day	1.00E-03	mg/kg-day	3.8.E-01
				Heptachlor epoxide	0.04598	mg/kg	5.04E-08	mg/kg-day	9.10E+00	$mg/kg\text{-}day^{-1}$	5.E-07	5.88E-07	mg/kg-day	1.30E-05	mg/kg-day	5.E-02
				Aroclor 1254	0.0463	mg/kg	5.07E-08	mg/kg-day	2.00E+00	$mg/kg\text{-}day^{-1}$	1.E-07	5.92E-07	mg/kg-day	2.00E-05	mg/kg-day	3.E-02
				2-Nitroaniline	0.0233	mg/kg	2.55E-08	mg/kg-day	--	--	--	2.98E-07	mg/kg-day	3.00E-03	mg/kg-day	1.E-04
				Di-n-octylphthalate	0.385	mg/kg	4.22E-07	mg/kg-day	--	--	--	4.92E-06	mg/kg-day	4.00E-02	mg/kg-day	1.E-04
				Benzo(a)anthracene*	0.0409	mg/kg	4.48E-08	mg/kg-day	7.30E-01	$mg/kg\text{-}day^{-1}$	2.E-07	5.23E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.146	mg/kg	1.60E-07	mg/kg-day	7.30E+00	$mg/kg\text{-}day^{-1}$	6.E-06	1.87E-06	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.0736	mg/kg	8.07E-08	mg/kg-day	7.30E-01	$mg/kg\text{-}day^{-1}$	3.E-07	9.41E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.0922	mg/kg	1.01E-07	mg/kg-day	7.30E+00	$mg/kg\text{-}day^{-1}$	4.E-06	1.18E-06	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene*	0.0667	mg/kg	7.31E-08	mg/kg-day	7.30E-01	$mg/kg\text{-}day^{-1}$	3.E-07	8.53E-07	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	7.217	mg/kg	7.91E-06	mg/kg-day	3.00E-02	$mg/kg\text{-}day^{-1}$	2.E-07	9.23E-05	mg/kg-day	5.00E-04	mg/kg-day	1.8.E-01
				2,4-Dinitrotoluene	1.247	mg/kg	1.37E-06	mg/kg-day	--	--	--	1.59E-05	mg/kg-day	2.00E-03	mg/kg-day	8.E-03
				2,6-Dinitrotoluene	2.274	mg/kg	2.49E-06	mg/kg-day	--	--	--	2.91E-05	mg/kg-day	1.00E-03	mg/kg-day	3.E-02
				Dinitrotoluene Mix	1.91	mg/kg	2.09E-06	mg/kg-day	6.80E-01	$mg/kg\text{-}day^{-1}$	1.E-06	2.44E-05	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	2.59E-06	mg/kg-day	1.70E-02	$mg/kg\text{-}day^{-1}$	4.E-08	3.02E-05	mg/kg-day	1.00E-04	mg/kg-day	3.0.E-01
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	1.03E-11	mg/kg-day	1.50E+05	$mg/kg\text{-}day^{-1}$	2.E-06	1.21E-10	mg/kg-day	--	--	--
			Exp. Route Total								2.E-05					2.E+00
			Dermal Absorption	Aluminum	12227	mg/kg	3.75E-04	mg/kg-day	--	--	--	4.38E-03	mg/kg-day	1.00E+00	mg/kg-day	4.E-03
				Antimony	0.87	mg/kg	2.67E-08	mg/kg-day	--	--	--	3.11E-07	mg/kg-day	6.00E-05	mg/kg-day	5.E-03
				Arsenic	1.32	mg/kg	1.22E-07	mg/kg-day	1.50E+00	$mg/kg\text{-}day^{-1}$	2.E-07	1.42E-06	mg/kg-day	3.00E-04	mg/kg-day	5.E-03
				Chromium	19.7	mg/kg	6.04E-07	mg/kg-day	--	--	--	7.05E-06	mg/kg-day	7.50E-05	mg/kg-day	9.E-02
				Cobalt	8.79	mg/kg	2.70E-07	mg/kg-day	--	--	--	3.15E-06	mg/kg-day	2.00E-02	mg/kg-day	2.E-04
				Iron	19503	mg/kg	5.98E-04	mg/kg-day	--	--	--	6.98E-03	mg/kg-day	7.00E-01	mg/kg-day	1.E-02
				Manganese	552.4	mg/kg	1.70E-05	mg/kg-day	--	--	--	1.98E-04	mg/kg-day	8.00E-04	mg/kg-day	2.5.E-01
				Vanadium	29.6	mg/kg	9.08E-07	mg/kg-day	--	--	--	1.06E-05	mg/kg-day	2.60E-05	mg/kg-day	4.1.E-01
				Heptachlor epoxide	0.04598	mg/kg	1.41E-08	mg/kg-day	9.10E+00	$mg/kg\text{-}day^{-1}$	1.E-07	1.65E-07	mg/kg-day	1.30E-05	mg/kg-day	1.E-02
				Aroclor 1254	0.0463	mg/kg	1.99E-08	mg/kg-day	2.00E+00	$mg/kg\text{-}day^{-1}$	4.E-08	2.32E-07	mg/kg-day	2.00E-05	mg/kg-day	1.E-02
				2-Nitroaniline	0.0233	mg/kg	7.15E-09	mg/kg-day	--	--	--	8.34E-08	mg/kg-day	3.00E-03	mg/kg-day	3.E-05
				Di-n-octylphthalate	0.385	mg/kg	1.18E-07	mg/kg-day	--	--	--	1.38E-06	mg/kg-day	4.00E-02	mg/kg-day	3.E-05
				Benzo(a)anthracene*	0.0409	mg/kg	1.63E-08	mg/kg-day	7.30E-01	$mg/kg\text{-}day^{-1}$	6.E-08	1.90E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.146	mg/kg	5.82E-08	mg/kg-day	7.30E+00	$mg/kg\text{-}day^{-1}$	2.E-06	6.79E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.0736	mg/kg	2.94E-08	mg/kg-day	7.30E-01	$mg/kg\text{-}day^{-1}$	1.E-07	3.43E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.0922	mg/kg	3.68E-08	mg/kg-day	7.30E+00	$mg/kg\text{-}day^{-1}$	1.E-06	4.29E-07	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene*	0.0667	mg/kg	2.66E-08	mg/kg-day	7.30E-01	$mg/kg\text{-}day^{-1}$	1.E-07	3.10E-07	mg/kg-day	--	--	--

TABLE E.1-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Soil Cont.	Soil Cont.		2,4,6-Trinitrotoluene	7.217	mg/kg	6.64E-07	mg/kg-day	3.00E-02	mg/kg-day^{-1}	2.E-08	7.75E-06	mg/kg-day	5.00E-04	mg/kg-day	2.E-02
				2,4-Dinitrotoluene	1.247	mg/kg	3.83E-07	mg/kg-day	--	--	--	4.46E-06	mg/kg-day	2.00E-03	mg/kg-day	2.E-03
				2,6-Dinitrotoluene	2.274	mg/kg	6.98E-07	mg/kg-day	--	--	--	8.14E-06	mg/kg-day	1.00E-03	mg/kg-day	8.E-03
				Dinitrotoluene Mix	1.91	mg/kg	5.86E-07	mg/kg-day	6.80E-01	mg/kg-day^{-1}	4.E-07	6.84E-06	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	7.24E-08	mg/kg-day	1.70E-02	mg/kg-day^{-1}	1.E-09	8.45E-07	mg/kg-day	1.00E-04	mg/kg-day	8.E-03
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	8.69E-13	mg/kg-day	1.50E+05	mg/kg-day^{-1}	1.E-07	1.01E-11	mg/kg-day	--	--	--
			Exp. Route Total								5.E-06					8.E-01
		Exposure Point Total									2.E-05					3.E+00
	Exposure Medium Total										2.E-05					3.E+00
	Air	Fugitive Dust	Inhalation	Aluminum	12227	mg/kg	2.96E-07	mg/kg-day	--	--	--	3.45E-06	mg/kg-day	1.00E-03	mg/kg-day	3.E-03
				Antimony	0.87	mg/kg	2.10E-11	mg/kg-day	--	--	--	2.45E-10	mg/kg-day	--	--	--
				Arsenic	1.32	mg/kg	3.19E-11	mg/kg-day	1.50E+01	mg/kg-day^{-1}	5.E-10	3.72E-10	mg/kg-day	--	--	--
				Chromium	19.7	mg/kg	4.76E-10	mg/kg-day	4.20E+01	mg/kg-day^{-1}	2.E-08	5.56E-09	mg/kg-day	3.00E-05	mg/kg-day	2.E-04
				Cobalt	8.79	mg/kg	2.13E-10	mg/kg-day	9.80E+00	mg/kg-day^{-1}	2.E-09	2.48E-09	mg/kg-day	5.70E-06	mg/kg-day	4.E-04
				Iron	19503	mg/kg	4.72E-07	mg/kg-day	--	--	--	5.50E-06	mg/kg-day	--	--	--
				Manganese	552.4	mg/kg	1.34E-08	mg/kg-day	--	--	--	1.56E-07	mg/kg-day	1.40E-05	mg/kg-day	1.E-02
				Vanadium	29.6	mg/kg	7.16E-10	mg/kg-day	--	--	--	8.35E-09	mg/kg-day	--	--	--
				Heptachlor epoxide	0.04598	mg/kg	1.11E-12	mg/kg-day	9.10E+00	mg/kg-day^{-1}	1.E-11	1.30E-11	mg/kg-day	--	--	--
				Aroclor 1254	0.0463	mg/kg	1.12E-12	mg/kg-day	2.00E+00	mg/kg-day^{-1}	2.E-12	1.31E-11	mg/kg-day	--	--	--
				2-Nitroaniline	0.0233	mg/kg	5.63E-13	mg/kg-day	--	--	--	6.57E-12	mg/kg-day	2.90E-05	mg/kg-day	2.E-07
				Di-n-octylphthalate	0.385	mg/kg	9.31E-12	mg/kg-day	--	--	--	1.09E-10	mg/kg-day	--	--	--
				Benzo(a)anthracene*	0.0409	mg/kg	9.89E-13	mg/kg-day	--	--	--	1.15E-11	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.146	mg/kg	3.53E-12	mg/kg-day	3.10E+00	mg/kg-day^{-1}	6.E-11	4.12E-11	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.0736	mg/kg	1.78E-12	mg/kg-day	--	--	--	2.08E-11	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.0922	mg/kg	2.23E-12	mg/kg-day	--	--	--	2.60E-11	mg/kg-day	--	--	--
				Indeno(1,2,3-cd)pyrene*	0.0667	mg/kg	1.61E-12	mg/kg-day	--	--	--	1.88E-11	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	7.217	mg/kg	1.75E-10	mg/kg-day	--	--	--	2.04E-09	mg/kg-day	--	--	--
				2,4-Dinitrotoluene	1.247	mg/kg	3.02E-11	mg/kg-day	--	--	--	3.52E-10	mg/kg-day	--	--	--
				2,6-Dinitrotoluene	2.274	mg/kg	5.50E-11	mg/kg-day	--	--	--	6.42E-10	mg/kg-day	--	--	--
				Dinitrotoluene Mix	1.91	mg/kg	4.62E-11	mg/kg-day	--	--	--	5.39E-10	mg/kg-day	--	--	--
				Nitroglycerin	2.36	mg/kg	5.71E-11	mg/kg-day	--	--	--	6.66E-10	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	2.28E-16	mg/kg-day	1.50E+05	mg/kg-day^{-1}	3.E-11	2.66E-15	mg/kg-day	--	--	--
			Exp. Route Total								2.E-08					2.E-02
		Exposure Point Total									2.E-08					2.E-02
	Exposure Medium Total										2.E-08					2.E-02
Soil Total											2.E-05					3.E+00

TABLE E.1-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Cobalt	2.4	ug/L	1.32E-05	mg/kg-day	--	--	--	1.53E-04	mg/kg-day	4.00E-04	mg/kg-day	4.E-01
				Manganese	190.5	ug/L	1.04E-03	mg/kg-day	--	--	--	1.22E-02	mg/kg-day	2.00E-02	mg/kg-day	6.E-01
				2,4,6-Trinitrotoluene	17	ug/L	9.32E-05	mg/kg-day	3.00E-02	mg/kg-day^{-1}	3.E-06	1.09E-03	mg/kg-day	5.00E-04	mg/kg-day	2.2.E+00
				Dinitrotoluene Mixture	0.65	ug/L	3.56E-06	mg/kg-day	6.80E-01	mg/kg-day^{-1}	2.E-06	4.16E-05	mg/kg-day	--	--	--
				RDX	8	ug/L	4.38E-05	mg/kg-day	1.10E-01	mg/kg-day^{-1}	5.E-06	5.11E-04	mg/kg-day	3.00E-03	mg/kg-day	1.7.E-01
				Perchlorate	2	ug/L	1.10E-05	mg/kg-day	--	--	--	1.28E-04	mg/kg-day	7.00E-04	mg/kg-day	2.E-01
			Exp. Route Total								1.E-05					4.E+00
			Dermal Absorption	Cobalt	2.4	ug/L	8.68E-08	mg/kg-day	--	--	--	1.01E-06	mg/kg-day	6.00E-05	mg/kg-day	2.E-02
				Manganese	190.5	ug/L	6.89E-06	mg/kg-day	--	--	--	8.04E-05	mg/kg-day	8.00E-04	mg/kg-day	1.E-01
				2,4,6-Trinitrotoluene	17	ug/L	2.55E-06	mg/kg-day	3.00E-02	mg/kg-day^{-1}	8.E-08	2.97E-05	mg/kg-day	5.00E-04	mg/kg-day	6.E-02
				Dinitrotoluene Mixture	0.65	ug/L	2.11E-07	mg/kg-day	6.80E-01	mg/kg-day^{-1}	1.E-07	2.46E-06	mg/kg-day	--	--	--
				RDX	8	ug/L	3.79E-07	mg/kg-day	3.00E-02	mg/kg-day^{-1}	1.E-08	4.42E-06	mg/kg-day	3.00E-03	mg/kg-day	1.E-03
				Perchlorate	2	ug/L	7.23E-08	mg/kg-day	--	--	--	8.44E-07	mg/kg-day	7.00E-04	mg/kg-day	1.E-03
			Exp. Route Total								2.E-07					2.E-01
		Exposure Point Total									1.E-05					4.E+00
	Exposure Medium Total										1.E-05					4.E+00
Groundwater Total											1.E-05					4.E+00
											Total of Receptor Risks Across All Media	3.2.E-05	Total of Receptor Hazards Across All Media			7.E+00

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.1-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timefram	Future
Receptor Populatio	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Total Soil	Soil	Soil	Ingestion	Aluminum	12227	mg/kg	--
				Antimony	0.87	mg/kg	--
				Arsenic	1.32	mg/kg	3.E-06
				Chromium	19.7	mg/kg	--
				Cobalt	8.79	mg/kg	--
				Iron	19503	mg/kg	--
				Manganese	552.4	mg/kg	--
				Vanadium	29.6	mg/kg	--
				Heptachlor epoxide	0.04598	mg/kg	7.E-07
				Aroclor 1254	0.0463	mg/kg	1.E-07
				2-Nitroaniline	0.0233	mg/kg	--
				Di-n-octylphthalate	0.385	mg/kg	--
				Benzo(a)anthracene*	0.0409	mg/kg	2.E-07
				Benzo(a)pyrene*	0.146	mg/kg	7.E-06
				Benzo(b)fluoranthene*	0.0736	mg/kg	4.E-07
				Dibenz(a,h)anthracene*	0.0922	mg/kg	5.E-06
				Indeno(1,2,3-cd)pyrene*	0.0667	mg/kg	3.E-07
				2,4,6-Trinitrotoluene	7.217	mg/kg	3.E-07
				2,4-Dinitrotoluene	1.247	mg/kg	--
				2,6-Dinitrotoluene	2.274	mg/kg	--
				Dinitrotoluene Mix	1.91	mg/kg	2.E-06
				Nitroglycerin	2.36	mg/kg	6.E-08
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	2.E-06
			Exp. Route Total				2.E-05
			Dermal Absorption	Aluminum	12227	mg/kg	--
				Antimony	0.87	mg/kg	--
				Arsenic	1.32	mg/kg	3.E-07
				Chromium	19.7	mg/kg	--
				Cobalt	8.79	mg/kg	--
				Iron	19503	mg/kg	--
				Manganese	552.4	mg/kg	--
				Vanadium	29.6	mg/kg	--
				Heptachlor epoxide	0.04598	mg/kg	2.E-07
				Aroclor 1254	0.0463	mg/kg	6.E-08
				2-Nitroaniline	0.0233	mg/kg	--
				Di-n-octylphthalate	0.385	mg/kg	--
				Benzo(a)anthracene*	0.0409	mg/kg	8.E-08
				Benzo(a)pyrene*	0.146	mg/kg	3.E-06
				Benzo(b)fluoranthene*	0.0736	mg/kg	1.E-07
				Dibenz(a,h)anthracene*	0.0922	mg/kg	2.E-06
				Indeno(1,2,3-cd)pyrene*	0.0667	mg/kg	1.E-07
				2,4,6-Trinitrotoluene	7.217	mg/kg	3.E-08
				2,4-Dinitrotoluene	1.247	mg/kg	--
				2,6-Dinitrotoluene	2.274	mg/kg	--
				Dinitrotoluene Mix	1.91	mg/kg	6.E-07
				Nitroglycerin	2.36	mg/kg	2.E-09
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	2.E-07
			Exp. Route Total				6.E-06
		Exposure Point Total					3.E-05
	Exposure Medium Total						3.E-05

TABLE E.1-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timefram	Future
Receptor Populatio	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	12227	mg/kg	--
				Antimony	0.87	mg/kg	--
				Arsenic	1.32	mg/kg	7.E-10
				Chromium	19.7	mg/kg	3.E-08
				Cobalt	8.79	mg/kg	3.E-09
				Iron	19503	mg/kg	--
				Manganese	552.4	mg/kg	--
				Vanadium	29.6	mg/kg	--
				Heptachlor epoxide	0.04598	mg/kg	1.E-11
				Aroclor 1254	0.0463	mg/kg	3.E-12
				2-Nitroaniline	0.0233	mg/kg	--
				Di-n-octylphthalate	0.385	mg/kg	--
				Benzo(a)anthracene*	0.0409	mg/kg	--
				Benzo(a)pyrene*	0.146	mg/kg	7.E-11
				Benzo(b)fluoranthene*	0.0736	mg/kg	--
				Dibenz(a,h)anthracene*	0.0922	mg/kg	--
				Indeno(1,2,3-cd)pyrene*	0.0667	mg/kg	--
				2,4,6-Trinitrotoluene	7.217	mg/kg	--
				2,4-Dinitrotoluene	1.247	mg/kg	--
				2,6-Dinitrotoluene	2.274	mg/kg	--
				Dinitrotoluene Mix	1.91	mg/kg	--
				Nitroglycerin	2.36	mg/kg	--
				2,3,7,8-TCDD Equivalents	9.44E-06	mg/kg	5.E-11
			Exp. Route Total				3.E-08
		Exposure Point Total					3.E-08
	Exposure Medium Total						3.E-08
Soil Total							3.E-05
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Cobalt	2.4	ug/L	--
				Manganese	190.5	ug/L	--
				2,4,6-Trinitrotoluene	17	ug/L	8.E-06
				Dinitrotoluene Mixture	0.65	ug/L	7.E-06
				RDX	8	ug/L	1.E-05
				Perchlorate	2	ug/L	--
			Exp. Route Total				3.E-05
			Dermal Absorption	Cobalt	2.4	ug/L	--
				Manganese	190.5	ug/L	--
				2,4,6-Trinitrotoluene	17	ug/L	2.E-07
				Dinitrotoluene Mixture	0.65	ug/L	4.E-07
				RDX	8	ug/L	3.E-08
				Perchlorate	2	ug/L	--
			Exp. Route Total				6.E-07
		Exposure Point Total					3.E-05
	Exposure Medium Total						3.E-05
Groundwater Total							3.E-05
							6.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.1-9.1.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Maintenance Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	2.5.E-03	--	8.E-05	3.E-03
			Arsenic	1.6.E-07	--	2.E-08	2.E-07	Arsenic	skin/ vascular	1.E-03	--	1.E-04	1.E-03
			Chromium	--	--	--	--	Chromium	NOAEL	1.3.E-03	--	2.E-03	3.E-03
			Cobalt	--	--	--	--	Cobalt	blood	9.E-05	--	3.E-06	9.E-05
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	5.7.E-03	--	2.E-04	5.9.E-03
			Manganese	--	--	--	--	Manganese	CNS	6.E-03	--	5.E-03	1.1.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	6.E-03	--	8.E-03	1.4.E-02
			Heptachlor epoxide	1.E-08	--	5.E-09	2.E-08	Heptachlor epoxide	liver	3.E-04	--	1.E-04	5.E-04
			Aroclor 1254	1.E-09	--	5.E-10	2.E-09	Aroclor 1254	eyes	7.E-05	--	3.E-05	1.E-04
			2-Nitroaniline	--	--	--	--	2-Nitroaniline	blood	2.E-06	--	6.E-07	2.E-06
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	1.E-06	--	4.E-07	1.E-06
			Benzo(a)pyrene	8.E-09	--	3.E-09	1.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthracene	1.E-08	--	5.E-09	2.E-08	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	4.E-09	--	2.E-09	6.E-09	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	3.E-08	--	3.E-09	3.E-08	2,4,6-Trinitrotoluene	liver	5.E-03	--	5.E-04	6.E-03
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	2.E-04	--	5.E-05	2.E-04
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	CNS/ blood/ liver	2.E-04	--	7.E-05	3.E-04
			Dinitrotoluene Mix	1.E-07	--	4.E-08	2.E-07	Dinitrotoluene Mix	--	--	--	--	--
			2,3,7,8-TCDD Equivalents	1.E-07	--	1.E-08	1.E-07	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
				5.E-07	--	9.E-08	5.E-07			2.9.E-02	--	1.6.E-02	4.E-02
		Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	2.E-04	--	2.E-04
			Arsenic	--	1.E-10	--	1.E-10	Arsenic	NA	--	--	--	--
			Chromium	--	5.E-09	--	5.E-09	Chromium	respiratory	--	1.E-05	--	1.E-05
			Cobalt	--	6.E-10	--	6.E-10	Cobalt	respiratory	--	3.E-05	--	3.E-05
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	8.E-04	--	8.E-04
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Heptachlor epoxide	--	1.E-12	--	1.E-12	Heptachlor epoxide	NA	--	--	--	--
			Aroclor 1254	--	1.E-13	--	1.E-13	Aroclor 1254	NA	--	--	--	--
			2-Nitroaniline	--	--	--	--	2-Nitroaniline	nose	--	2.E-08	--	2.E-08
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)pyrene	--	3.E-13	--	3.E-13	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	--	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	9.E-12	--	9.E-12	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
				--	6.E-09	--	6.E-09			--	1.E-03	--	1.E-03
						Total Risk Across Soil	5.E-07					Total Hazard Index Across Soil	5.E-02

Total Risk Across All Media and All Exposure Routes	5.E-07
Total Hazard Index Across All Media and All Exposure Routes	5.E-02

Total blood HI across all media =	6.E-03
Total CNS HI across all media =	1.E-02
Total skin HI across all media =	1.E-03
Total respiratory HI across all media =	4.E-05
Total GI tract HI across all media =	6.E-03
Total kidney HI across all media =	1.E-02
Total liver HI across all media =	1.E-02
Total vascular HI across all media =	1.E-03
Total eyes HI across all media =	1.E-04

TABLE E.1-9.2.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Commercial Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	6.E-03	--	4.E-04	6.E-03
			Antimony	--	--	--	--	Antimony	blood	1.E-03	--	5.E-04	2.E-03
			Arsenic	3.E-07	--	7.E-08	4.E-07	Arsenic	skin/ vascular	2.E-03	--	4.E-04	3.E-03
			Chromium	--	--	--	--	Chromium	NOAEL	3.E-03	--	8.E-03	1.E-02
			Cobalt	--	--	--	--	Cobalt	blood	2.E-04	--	1.E-05	2.E-04
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	1.4.E-02	--	9.E-04	1.E-02
			Manganese	--	--	--	--	Manganese	CNS	1.4.E-02	--	2.E-02	4.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	1.4.E-02	--	3.7.E-02	5.E-02
			Heptachlor epoxide	7.E-08	--	5.E-08	1.E-07	Heptachlor epoxide	liver	2.E-03	--	1.E-03	3.E-03
			Aroclor 1254	2.E-08	--	1.E-08	3.E-08	Aroclor 1254	eyes	1.E-03	--	1.E-03	2.E-03
			2-Nitroaniline	--	--	--	--	2-Nitroaniline	blood	4.E-06	--	3.E-06	6.E-06
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	5.E-06	--	3.E-06	8.E-06
			Benzo(a)anthracene	5.E-09	--	4.E-09	1.E-08	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	2.E-07	--	2.E-07	3.E-07	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	9.E-09	--	8.E-09	2.E-08	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthracene	1.E-07	--	1.E-07	2.E-07	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	9.E-09	--	7.E-09	2.E-08	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	4.E-08	--	7.E-09	5.E-08	2,4,6-Trinitrotoluene	liver	7.E-03	--	1.E-03	8.E-03
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	3.E-04	--	2.E-04	5.E-04
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	CNS/ blood/ liver	1.E-03	--	7.E-04	2.E-03
			Dinitrotoluene Mix	2.E-07	--	1.E-07	4.E-07	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	7.E-09	--	5.E-10	7.E-09	Nitroglycerin	vascular	1.E-02	--	8.E-04	1.E-02
			2,3,7,8-TCDD Equivalents	2.E-07	--	5.E-08	3.E-07	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	1.E-06	--	6.E-07	2.E-06	Total		8.E-02	--	8.E-02	2.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	1.E-03	--	1.E-03
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	8.E-10	--	8.E-10	Arsenic	NA	--	--	--	--
			Chromium	--	3.4.E-08	--	3.4.E-08	Chromium	respiratory	--	8.E-05	--	8.E-05
			Cobalt	--	3.5.E-09	--	3.5.E-09	Cobalt	respiratory	--	2.E-04	--	2.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	5.E-03	--	5.E-03
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Heptachlor epoxide	--	2.E-11	--	2.E-11	Heptachlor epoxide	NA	--	--	--	--
			Aroclor 1254	--	4.E-12	--	4.E-12	Aroclor 1254	NA	--	--	--	--
			2-Nitroaniline	--	--	--	--	2-Nitroaniline	nose	--	9.E-08	--	9.E-08
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	--	2.E-11	--	2.E-11	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	6.E-11	--	6.E-11	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	--	4.E-08	--	4.E-08	Total		--	6.E-03	--	6.E-03

TABLE E.1-9.2.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Commercial Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater used as tapwater	Cobalt	--	--	--	--	Cobalt	blood	6.E-02	--	3.E-04	6.E-02
			Manganese	--	--	--	--	Manganese	CNS	9.E-02	--	2.E-03	1.E-01
			2,4,6-Trinitrotoluene	1.8.E-06	--	6.E-09	1.8.E-06	2,4,6-Trinitrotoluene	liver	3.E-01	--	1.E-03	3.E-01
			Dinitrotoluene Mixture	1.5.E-06	--	1.E-08	1.6.E-06	Dinitrotoluene Mixture	NA	--	--	--	--
			RDX	3.1.E-06	--	9.E-10	3.1.E-06	RDX	prostate	3.E-02	--	3.E-05	3.E-02
			Perchlorate	--	--	9.E-10	8.8.E-10	Perchlorate	thyroid	3.E-02	--	3.E-05	3.E-02
			Total	6.E-06	--	2.E-08	6.E-06	Total		5.E-01	--	3.E-03	5.E-01
							Total Risk Across Soil						Total Hazard Index Across Soil
							2.E-06						2.E-01
							Total Risk Across Groundwater						Total Hazard Index Across Groundwater
							6.E-06						5.E-01

Total Risk Across All Media and All Exposure Routes	8.E-06

Total Hazard Index Across All Media and All Exposure Routes	7.E-01

Total blood HI across all media =	8.E-02
Total CNS HI across all media =	1.E-01
Total skin HI across all media =	3.E-03
Total respiratory HI across all media =	3.E-04
Total GI tract HI across all media =	1.E-02
Total kidney HI across all media =	5.E-02
Total liver HI across all media =	4.E-01
Total vascular HI across all media =	1.E-02
Total eyes HI across all media =	2.E-03
Total prostate HI across all media =	3.E-02
Total thyroid HI across all media =	3.E-02

TABLE E.1-9.3.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Construction Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	4.E-02	--	1.E-03	4.E-02
			Antimony	--	--	--	--	Antimony	blood	1.E-02	--	3.E-03	2.E-02
			Arsenic	9.E-08	--	8.E-09	1.E-07	Arsenic	skin/ vascular	1.E-02	--	1.E-03	2.E-02
			Chromium	--	--	--	--	Chromium	NOAEL	3.E-03	--	4.E-03	7.E-03
			Cobalt	--	--	--	--	Cobalt	blood	1.E-03	--	4.E-05	1.E-03
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	9.E-02	--	3.E-03	9.E-02
			Manganese	--	--	--	--	Manganese	CNS	9.E-02	--	7.E-02	2.E-01
			Vanadium	--	--	--	--	Vanadium	kidney	1.E-02	--	2.E-02	3.E-02
			Heptachlor epoxide	2.E-08	--	6.E-09	3.E-08	Heptachlor epoxide	liver	1.E-02	--	3.E-03	1.E-02
			Aroclor 1254	4.E-09	--	2.E-09	6.E-09	Aroclor 1254	eyes	3.E-03	--	1.E-03	4.E-03
			2-Nitroaniline	--	--	--	--	2-Nitroaniline	blood	3.E-05	--	8.E-06	3.E-05
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	3.E-06	--	9.E-07	4.E-06
			Benzo(a)anthracene	1.E-09	--	5.E-10	2.E-09	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	5.E-08	--	2.E-08	7.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	2.E-09	--	1.E-09	3.E-09	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthracene	3.E-08	--	1.E-08	4.E-08	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	2.E-09	--	9.E-10	3.E-09	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	1.E-08	--	9.E-10	1.E-08	2,4,6-Trinitrotoluene	liver	5.E-02	--	4.E-03	5.E-02
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	2.E-03	--	6.E-04	3.E-03
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	CNS/ blood/ liver	7.E-04	--	2.E-04	1.E-03
			Dinitrotoluene Mix	6.E-08	--	2.E-08	8.E-08	Dinitrotoluene Mix	--	--	--	--	--
			Nitroglycerin	2.E-09	--	6.E-11	2.E-09	Nitroglycerin	vascular	8.E-02	--	2.E-03	8.E-02
			2,3,7,8-TCDD Equivalents	7.E-08	--	6.E-09	7.E-08	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	3.E-07	--	7.E-08	4.E-07	Total		4.E-01	--	1.E-01	5.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	2.E+00	--	2.E+00
			Antimony	--	--	--	--	Antimony	NA	--	1.E-03	--	1.E-03
			Arsenic	--	5.E-08	--	5.E-08	Arsenic	NA	--	--	--	--
			Chromium	--	2.E-06	--	2.E-06	Chromium	respiratory	--	1.E-01	--	1.E-01
			Cobalt	--	2.E-07	--	2.E-07	Cobalt	respiratory	--	3.E-01	--	3.E-01
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	6.4.E+00	--	6.4.E+00
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Heptachlor epoxide	--	1.E-09	--	1.E-09	Heptachlor epoxide	NA	--	--	--	--
			Aroclor 1254	--	2.E-10	--	2.E-10	Aroclor 1254	NA	--	--	--	--
			2-Nitroaniline	--	--	--	--	2-Nitroaniline	nose	--	1.E-05	--	1.E-05
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)anthracene	--	--	--	--	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	--	1.E-09	--	1.E-09	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	--	--	--	--	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene	--	--	--	--	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	3.E-09	--	3.E-09	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	--	2.E-06	--	2.E-06	Total		--	9.E+00	--	9.E+00

TABLE E.1-9.3.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Construction Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Cobalt	--	--	--	--	Cobalt	blood	1.E-03	--	5.E-03	6.E-03
			Manganese	--	--	--	--	Manganese	CNS	9.E-04	--	2.E-02	2.E-02
			2,4,6-Trinitrotoluene	7.E-10	--	1.E-09	1.7.E-09	2,4,6-Trinitrotoluene	liver	3.E-03	--	5.E-03	8.E-03
			Dinitrotoluene Mixture	6.E-10	--	2.E-09	2.6.E-09	Dinitrotoluene Mixture	NA	--	--	--	--
			RDX	1.E-09	--	1.E-10	1.4.E-09	RDX	prostate	3.E-04	--	1.E-04	4.E-04
			Perchlorate	--	--	--	--	Perchlorate	thyroid	3.E-04	--	2.E-04	5.E-04
			Total	3.E-09	--	3.E-09	6.E-09	Total		6.E-03	--	3.E-02	3.E-02

Total Risk Across Soil	3.E-06
Total Risk Across Groundwater	6.E-09
Total Risk Across All Media and All Exposure Routes	3.E-06

Total Hazard Index Across Soil	9.E+00
Total Hazard Index Across Groundwater	3.E-02
Total Hazard Index Across All Media and All Exposure Routes	9.E+00

Total blood HI across all media =	1.E-01
Total CNS HI across all media =	9.E+00
Total skin HI across all media =	2.E-02
Total respiratory HI across all media =	4.E-01
Total GI tract HI across all media =	9.E-02
Total kidney HI across all media =	3.E-02
Total liver HI across all media =	2.E-01
Total vascular HI across all media =	9.E-02
Total eyes HI across all media =	4.E-03
Total thyroid HI across all media =	5.E-04

TABLE E.1-9.4.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adult Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	2.E-02	--	7.E-04	2.E-02
			Antimony	--	--	--	--	Antimony	blood	3.E-03	--	8.E-04	4.E-03
			Arsenic	9.E-07	--	1.E-07	1.E-06	Arsenic	skin/ vascular	6.E-03	--	7.E-04	7.E-03
			Chromium	--	--	--	--	Chromium	NOAEL	9.E-03	--	1.E-02	2.E-02
			Cobalt	--	--	--	--	Cobalt	blood	6.E-04	--	2.E-05	6.E-04
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	4.E-02	--	2.E-03	4.E-02
			Manganese	--	--	--	--	Manganese	CNS	4.E-02	--	4.E-02	8.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	4.E-02	--	6.E-02	1.E-01
			Heptachlor epoxide	2.E-07	--	8.E-08	3.E-07	Heptachlor epoxide	liver	5.E-03	--	2.E-03	7.E-03
			Aroclor 1254	4.E-08	--	2.E-08	7.E-08	Aroclor 1254	eyes	3.E-03	--	2.E-03	5.E-03
			2-Nitroaniline	--	--	--	--	2-Nitroaniline	blood	1.E-05	--	4.E-06	1.E-05
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	1.E-05	--	5.E-06	2.E-05
			Benzo(a)anthracene*	3.E-08	--	1.E-08	4.E-08	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene*	9.E-07	--	5.E-07	1.E-06	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene*	5.E-08	--	2.E-08	7.E-08	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthracene*	6.E-07	--	3.E-07	9.E-07	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene*	4.E-08	--	2.E-08	6.E-08	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	1.E-07	--	1.E-08	1.E-07	2,4,6-Trinitrotoluene	liver	2.E-02	--	2.E-03	2.E-02
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	9.E-04	--	3.E-04	1.E-03
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	CNS/ blood/ liver	3.E-03	--	1.E-03	4.E-03
			Dinitrotoluene Mix	6.E-07	--	2.E-07	9.E-07	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	2.E-08	--	8.E-10	2.E-08	Nitroglycerin	vascular	3.E-02	--	1.E-03	3.E-02
			2,3,7,8-TCDD Equivalents	7.E-07	--	8.E-08	7.E-07	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	4.E-06	--	1.E-06	6.E-06	Total		2.E-01	--	1.E-01	3.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	3.E-04	--	3.E-04
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	2.E-10	--	2.E-10	Arsenic	NA	--	--	--	--
			Chromium	--	7.E-09	--	7.E-09	Chromium	respiratory	--	2.E-05	--	2.E-05
			Cobalt	--	7.E-10	--	7.E-10	Cobalt	respiratory	--	4.E-05	--	4.E-05
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	1.E-03	--	1.E-03
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Heptachlor epoxide	--	4.E-12	--	4.E-12	Heptachlor epoxide	NA	--	--	--	--
			Aroclor 1254	--	8.E-13	--	8.E-13	Aroclor 1254	NA	--	--	--	--
			2-Nitroaniline	--	--	--	--	2-Nitroaniline	nose	--	2.E-08	--	2.E-08
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)anthracene*	--	--	--	--	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene*	--	7.E-12	--	7.E-12	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene*	--	--	--	--	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthracene*	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene*	--	--	--	--	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	1.E-11	--	1.E-11	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	--	8.E-09	--	8.E-09	Total		--	1.E-03	--	1.E-03

TABLE E.1-9.4.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adult Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater used as tapwater	Cobalt	--	--	--	--	Cobalt	blood	2.E-01	--	6.E-03	2.E-01
			Manganese	--	--	--	--	Manganese	CNS	3.E-01	--	3.E-02	3.E-01
			2,4,6-Trinitrotoluene	5.E-06	--	1.E-07	5.E-06	2,4,6-Trinitrotoluene	liver	9.E-01	--	3.E-02	1.E+00
			Dinitrotoluene Mixture	4.E-06	--	3.E-07	4.E-06	Dinitrotoluene Mixture	NA	--	--	--	--
			RDX	8.E-06	--	2.E-08	8.E-06	RDX	prostate	7.E-02	--	7.E-04	7.E-02
			Perchlorate	--	--	--	--	Perchlorate	thyroid	8.E-02	--	4.E-04	8.E-02
			Total	1.7.E-05	--	4.E-07	1.8.E-05	Total		1.5.E+00	--	7.E-02	1.6.E+00

Total Risk Across Soil	6.E-06
Total Risk Across Groundwater	1.8.E-05
Total Risk Across All Media and All Exposure Routes	2.E-05

Total Hazard Index Across Soil	3.E-01
Total Hazard Index Across Groundwater	1.6.E+00
Total Hazard Index Across All Media and All Exposure Routes	2.E+00

Total blood HI across all media =	2.E-01
Total CNS HI across all media =	4.E-01
Total skin HI across all media =	7.E-03
Total respiratory HI across all media =	6.E-05
Total GI tract HI across all media =	4.E-02
Total kidney HI across all media =	1.E-01
Total liver HI across all media =	1.E+00
Total vascular HI across all media =	4.E-02
Total eyes HI across all media =	5.E-03
Total prostate HI across all media =	7.E-02
Total thyroid HI across all media =	8.E-02

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.1-9.5.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Child Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	2.E-01	--	4.E-03	2.E-01
			Antimony	--	--	--	--	Antimony	blood	3.E-02	--	5.E-03	3.E-02
			Arsenic	2.E-06	--	2.E-07	2.E-06	Arsenic	skin/ vascular	6.E-02	--	5.E-03	6.E-02
			Chromium	--	--	--	--	Chromium	NOAEL	8.E-02	--	9.E-02	2.E-01
			Cobalt	--	--	--	--	Cobalt	blood	6.E-03	--	2.E-04	6.E-03
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	4.E-01	--	1.E-02	4.E-01
			Manganese	--	--	--	--	Manganese	CNS	4.E-01	--	2.E-01	6.E-01
			Vanadium	--	--	--	--	Vanadium	kidney	4.E-01	--	4.E-01	8.E-01
			Heptachlor epoxide	5.E-07	--	1.E-07	6.E-07	Heptachlor epoxide	liver	5.E-02	--	1.E-02	6.E-02
			Aroclor 1254	1.E-07	--	4.E-08	1.E-07	Aroclor 1254	eyes	3.E-02	--	1.E-02	4.E-02
			2-Nitroaniline	--	--	--	--	2-Nitroaniline	blood	1.E-04	--	3.E-05	1.E-04
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	1.E-04	--	3.E-05	2.E-04
			Benzo(a)anthracene*	2.E-07	--	6.E-08	2.E-07	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene*	6.E-06	--	2.E-06	8.E-06	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene*	3.E-07	--	1.E-07	4.E-07	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthracene*	4.E-06	--	1.E-06	5.E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene*	3.E-07	--	1.E-07	4.E-07	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	2.E-07	--	2.E-08	3.E-07	2,4,6-Trinitrotoluene	liver	2.E-01	--	2.E-02	2.E-01
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	8.E-03	--	2.E-03	1.E-02
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	CNS/ blood/ liver	3.E-02	--	8.E-03	4.E-02
			Dinitrotoluene Mix	1.E-06	--	4.E-07	2.E-06	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	4.E-08	--	1.E-09	5.E-08	Nitroglycerin	vascular	3.E-01	--	8.E-03	3.E-01
			2,3,7,8-TCDD Equivalents	2.E-06	--	1.E-07	2.E-06	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	2.E-05	--	5.E-06	2.E-05	Total		2.E+00	--	8.E-01	3.E+00
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	3.E-03	--	3.E-03
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	5.E-10	--	5.E-10	Arsenic	NA	--	--	--	--
			Chromium	--	2.E-08	--	2.E-08	Chromium	respiratory	--	2.E-04	--	2.E-04
			Cobalt	--	2.E-09	--	2.E-09	Cobalt	respiratory	--	4.E-04	--	4.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	1.E-02	--	1.E-02
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Heptachlor epoxide	--	1.E-11	--	1.E-11	Heptachlor epoxide	NA	--	--	--	--
			Aroclor 1254	--	2.E-12	--	2.E-12	Aroclor 1254	NA	--	--	--	--
			2-Nitroaniline	--	--	--	--	2-Nitroaniline	nose	--	2.E-07	--	2.E-07
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)anthracene*	--	--	--	--	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene*	--	6.E-11	--	6.E-11	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene*	--	--	--	--	Benzo(b)fluoranthene	NA	--	--	--	--
			Dibenz(a,h)anthracene*	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			Indeno(1,2,3-cd)pyrene*	--	--	--	--	Indeno(1,2,3-cd)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	--	--	--	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	--	2.E-08	--	2.E-08	Total		--	2.E-02	--	2.E-02

TABLE E.1-9.5.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Child Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater used as tapwater	Cobalt	--	--	--	--	Cobalt	blood	4.E-01	--	2.E-02	4.E-01
			Manganese	--	--	--	--	Manganese	CNS	6.E-01	--	1.E-01	7.E-01
			2,4,6-Trinitrotoluene	3.E-06	--	8.E-08	3.E-06	2,4,6-Trinitrotoluene	liver	2.E+00	--	6.E-02	2.E+00
			Dinitrotoluene Mixture	2.E-06	--	1.E-07	3.E-06	Dinitrotoluene Mixture	NA	--	--	--	--
			RDX	5.E-06	--	1.E-08	5.E-06	RDX	prostate	2.E-01	--	1.E-03	2.E-01
			Perchlorate	--	--	--	--	Perchlorate	thyroid	2.E-01	--	1.E-03	2.E-01
			Total	1.E-05	--	2.E-07	1.E-05	Total		4.E+00	--	2.E-01	4.E+00
							Total Risk Across Soil						Total Hazard Index Across Soil
							2.E-05						3.E+00
							Total Risk Across Groundwater						Total Hazard Index Across Groundwater
							1.E-05						4.E+00
							Total Risk Across All Media and All Exposure Routes						Total Hazard Index Across All Media and All Exposure Routes
							3.E-05						7.E+00

Total blood HI across all media =	9.E-01
Total CNS HI across all media =	2.E+00
Total skin HI across all media =	6.E-02
Total respiratory HI across all media =	6.E-04
Total GI tract HI across all media =	4.E-01
Total kidney HI across all media =	8.E-01
Total liver HI across all media =	3.E+00
Total vascular HI across all media =	4.E-01
Total eyes HI across all media =	4.E-02
Total prostate HI across all media =	2.E-01
Total thyroid HI across all media =	2.E-01

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.1-9.6.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Lifetime Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--
			Antimony	--	--	--	--
			Arsenic	3.E-06	--	3.E-07	3.E-06
			Chromium	--	--	--	--
			Cobalt	--	--	--	--
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Vanadium	--	--	--	--
			Heptachlor epoxide	7.E-07	--	2.E-07	9.E-07
			Aroclor 1254	1.E-07	--	6.E-08	2.E-07
			2-Nitroaniline	--	--	--	--
			Di-n-octylphthalate	--	--	--	--
			Benzo(a)anthracene*	2.E-07	--	8.E-08	3.E-07
			Benzo(a)pyrene*	7.E-06	--	3.E-06	1.E-05
			Benzo(b)fluoranthene*	4.E-07	--	1.E-07	5.E-07
			Dibenz(a,h)anthracene*	5.E-06	--	2.E-06	6.E-06
			Indeno(1,2,3-cd)pyrene*	3.E-07	--	1.E-07	5.E-07
			2,4,6-Trinitrotoluene	3.E-07	--	3.E-08	4.E-07
			2,4-Dinitrotoluene	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--
			Dinitrotoluene Mix	2.E-06	--	6.E-07	3.E-06
			Nitroglycerin	6.E-08	--	2.E-09	6.E-08
			2,3,7,8-TCDD Equivalents	2.E-06	--	2.E-07	2.E-06
			Total	2.E-05	--	6.E-06	2.7.E-05
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--
			Antimony	--	--	--	--
			Arsenic	--	7.E-10	--	7.E-10
			Chromium	--	3.E-08	--	3.E-08
			Cobalt	--	3.E-09	--	3.E-09
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Vanadium	--	--	--	--
			Heptachlor epoxide	--	1.E-11	--	1.E-11
			Aroclor 1254	--	3.E-12	--	3.E-12
			2-Nitroaniline	--	--	--	--
			Di-n-octylphthalate	--	--	--	--
			Benzo(a)anthracene*	--	--	--	--
			Benzo(a)pyrene*	--	7.E-11	--	7.E-11
			Benzo(b)fluoranthene*	--	--	--	--
			Dibenz(a,h)anthracene*	--	--	--	--
			Indeno(1,2,3-cd)pyrene*	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--
			Nitroglycerin	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	5.E-11	--	5.E-11
			Total	--	3.E-08	--	3.E-08
Groundwater	Groundwater	Groundwater used as tapwater	Cobalt	--	--	--	--
			Manganese	--	--	--	--
			2,4,6-Trinitrotoluene	8.E-06	--	2.E-07	8.E-06
			Dinitrotoluene Mixture	7.E-06	--	4.E-07	7.E-06
			RDX	1.E-05	--	3.E-08	1.E-05
			Perchlorate	--	--	--	--
			Total	3.E-05	--	6.E-07	2.8.E-05
						Total Risk Across Soil	2.7.E-05
						Total Risk Across Groundwater	2.8.E-05

Total Risk Across All Media and All Exposure Routes: 6.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.1-10.1.RME
RME Risk Assessment Summary: Construction Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	None Identified					Manganese	CNS	9.E-02	--	7.E-02	2.E-01
			Total	--	--	--	--	Total		9.E-02	--	7.E-02	2.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	2.E+00	--	2.E+00
			Manganese	--	--	--	--	Manganese	CNS	--	6.E+00	--	6.4.E+00
			Total	--	--	--	--	Total		--	8.4.E+00	--	8.4.E+00
Groundwater	Groundwater	Groundwater	None Identified					None Identified					
			Total	--	--	--	--	Total		--	--	--	--
							Total Risk Across Soil	--					Total Hazard Index Across Soil	9.E+00
							Total Risk Across Groundwater	--					Total Hazard Index Across Groundwater	--
							Total Risk Across All Media and All Exposure Routes	--					Total Hazard Index Across All Media and All Exposure Routes	9.E+00
													Total CNS HI across all media =	9.E+00

TABLE E.1-10.2.RME
RME Risk Assessment Summary: Child Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Non-Carcinogenic Hazard Quotient				
				Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	developmental CNS	2.E-01	--	4.E-03	2.E-01
			Iron	blood/ liver/ GI tract	4.E-01	--	1.E-02	4.E-01
			Manganese	CNS	4.E-01	--	2.E-01	6.E-01
			2,4,6-Trinitrotoluene	liver	2.E-01	--	2.E-02	2.E-01
			Total		1.E+00	--	3.E-01	1.3.E+00
	Air	Air (Fugitive Dust)	None Identified					
			Total		--	--	--	--
Groundwater	Groundwater	Groundwater Used as Tapwater	Manganese	CNS	6.E-01	--	1.E-01	7.E-01
			2,4,6-Trinitrotoluene	liver	2.E+00	--	6.E-02	2.E+00
			Total		2.E+00	--	6.E-02	2.9.E+00

Total Hazard Index Across Soil	1.3.E+00
Total Hazard Index Across Groundwater	2.9.E+00
Total Hazard Index Across All Media and All Exposure Routes	4.E+00
Total CNS HI across all media =	2.E+00
Total liver HI across all media =	3.E+00

IRON MARGIN OF EXPOSURE EVALUATION

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Table 1
Iron "Margin of Exposure" Evaluation
SMWU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Total Soil - Child Resident - SWMU 54 Area A				
Iron EPC (mg/kg)	Child Daily Intake Estimate* (mg/day)	RDA for Child 6 mths to 4 years Old	Child Daily Intake ** (mg/kg-day)	Provisional RfD (mg/kg-day)
19,503	3.7	10 mg/day	0.25	0.7
Total Soil - Child Resident - SWMU 54 Area B				
Iron EPC (mg/kg)	Child Daily Intake Estimate* (mg/day)	RDA for Child 6 mths to 4 years Old	Child Daily Intake ** (mg/kg-day)	Provisional RfD (mg/kg-day)
20,993	4.0	10 mg/day	0.27	0.7

* See Table H-2 for equations used to calculated daily intake estimates.
** Default weight of 15 kg used for child

Table 2
Iron "Margin of Exposure" Evaluation
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation
Ingestion-Total Soil	Resident	Child	SWMU 40/71	AT-NC	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991a	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	Chronic
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	MDC or EPC	Daily = $\frac{CS*IRS*EF*ED*FI*CF1}{BW*AT}$
				ED	Exposure Duration	6	years	USEPA, 1991a	Intake
				EF	Exposure Frequency	350	days/year	USEPA, 1991a	(mg/day)
				FI	Fraction Ingested	1	(unitless)		
				IRS	Ingestion Rate of Soil	200	mg/day	USEPA, 1991a	

LEAD IEUBK MODEL RESULTS

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LEAD MODEL FOR WINDOWS Version 1.0

==========
Model Version: 1.0 Build 264
User Name: Tina DeVine
Date: 6/26/2008
Site Name: RFAAP
Operable Unit: SWMU 54
Run Mode: Site Risk Assessment

Water Data
MDL for Lead
Soil/Dust Data
Mean Concentations for Lead
==========
The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.300 ug Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used

Average multiple source concentration: 42.550 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	46.500	42.550
1-2	46.500	42.550
2-3	46.500	42.550
3-4	46.500	42.550
4-5	46.500	42.550
5-6	46.500	42.550
6-7	46.500	42.550

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

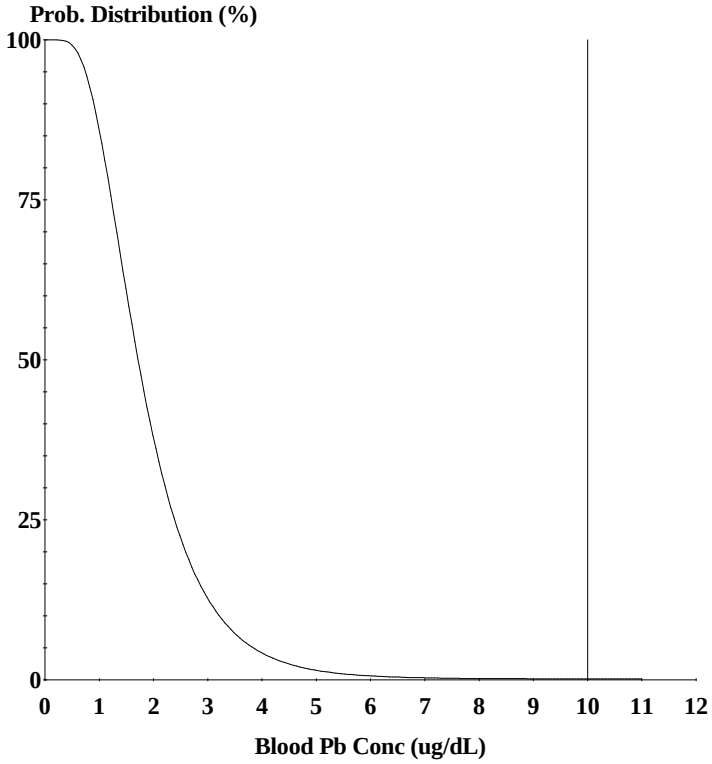
****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 2.500 ug Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.647	0.000	0.124
1-2	0.034	2.771	0.000	0.312
2-3	0.062	3.123	0.000	0.325
3-4	0.067	3.021	0.000	0.334
4-5	0.067	2.931	0.000	0.349
5-6	0.093	3.100	0.000	0.369
6-7	0.093	3.425	0.000	0.375

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	1.082	3.874	2.1
1-2	1.722	4.839	2.1
2-3	1.728	5.238	1.9
3-4	1.738	5.160	1.8
4-5	1.297	4.643	1.6
5-6	1.170	4.732	1.5
6-7	1.106	4.999	1.4



Cutoff = 10.000 ug/dl
Geo Mean = 1.799
GSD = 1.600
% Above = 0.013

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment

Table 1
Calculation of Blood Lead Concentrations using ALM - Construction Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1 GSDi = Hom	Using Equation 1 GSDi = Het	Using Equation 2 GSDi = Hom	Using Equation 2 GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	46.5	46.5	46.5	46.5
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.330	0.330	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.330	0.330
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	250	250	250	250
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**2.0**	**2.2**	**2.0**	**2.2**
$PbB_{fetal, 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**6.1**	**7.8**	**6.1**	**7.8**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**1.0%**	**2.6%**	**1.0%**	**2.6%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 2
Calculation of Blood Lead Concentrations using ALM - Commercial Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1 GSDi = Hom	Using Equation 1 GSDi = Het	Using Equation 2 GSDi = Hom	Using Equation 2 GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	46.5	46.5	46.5	46.5
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.050	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	250	250	250	250
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**1.6**	**1.8**	**1.6**	**1.8**
$PbB_{fetal, 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**4.8**	**6.3**	**4.8**	**6.3**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**0.4%**	**1.4%**	**0.4%**	**1.4%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 3
Calculation of Blood Lead Concentrations using ALM - Maintenance Worker - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
					Using Equation 1		Using Equation 2	
					GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	69.7	69.7	69.7	69.7
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.100	0.100
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**1.7**	**1.9**	**1.7**	**1.9**
$PbB_{fetal, 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**5.2**	**6.7**	**5.2**	**6.7**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**0.6%**	**1.7%**	**0.6%**	**1.7%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

APPENDIX E.2

HHRA TABLES – AREA B

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TABLE E.2-1
Selection of Exposure Pathways - SWMU 54 - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil	Surface Soil	Surface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
		Air	Ambient Air Above Surface Soil (Particulates)[2]	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest subsurface soil from the site since maintenance does not include excavation.
						Dermal Absorption	None	Receptor is not likely to come in contact with subsurface soil from the site since maintenance does not include excavation.
		Air	Ambient Air Above Subsurface Soil (Particulates)[2]	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale particulates from ambient air above the subsurface soil since maintenance activities do not include excavation.
	Groundwater [1]	Groundwater	Groundwater	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest groundwater from the site during maintenance activities.
						Dermal Absorption	None	Receptor is not likely to contact groundwater from the site during maintenance activities.
		Air	Upward Migration of Vapors from Groundwater (Outdoors)[2]	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air.
			Upward Migration of Vapors from Groundwater (Indoors)[2]	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
			Vapors while Showering[2]	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
Future	Surface Soil	Surface Soil	Surface Soil	Commerical/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil while working on site.
						Dermal Absorption	Quant	Receptor could contact surface soil while working on site.
				Construction Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site during construction activities.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site during construction activities.
				Resident	Child	Ingestion	Quant	Receptor could ingest surface soil while living on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while living on site.
					Adult	Ingestion	Quant	Receptor could ingest surface soil while living on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while living on site.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Ambient Air Above Surface Soil (Particulates)[2]	Commerical/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil while working on site.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil.
				Resident	Child	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil while living on site.
					Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil while living on site.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
			Upward Migration of Vapors from Soil (Indoors)[2]	Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into building.[2]
				Resident	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.[2]
					Child	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.[2]

TABLE E.2-1
Selection of Exposure Pathways - SWMU 54 - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Subsurface Soil	Subsurface Soil	Subsurface Soil	Commerical/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
						Dermal Absorption	Quant	Receptor could contact subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
				Construction Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil from the site while during construction activities.
						Dermal Absorption	Quant	Receptor could come into contact with subsurface soil from the site during construction activities.
				Resident	Child	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a residence.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction of a residence.
					Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a residence.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction of a residence.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Ambient Air Above Subsurface Soil (Particulates)[2]	Commerical/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil during construction activities.
				Resident	Child	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from construction of a residence.
					Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from constuction of a residence.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
			Upward Migration of Vapors from Soil (Indoors)[2]	Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into building.[2]
				Resident	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.[2]
					Child	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.[2]

TABLE E.2-1
Selection of Exposure Pathways - SWMU 54 - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Groundwater[1]	Groundwater	Groundwater	Commercial/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply for industrial process.
				Construction Worker	Adult	Ingestion	Quant	Due to the depth to groundwater (approximately 16-20 ft bgs), the receptor is not likely to ingest groundwater during excavation activities.
						Dermal Absorption	Quant	Due to the depth to groundwater (approximately 16-20 ft bgs), the receptor is not likely to contact groundwater during excavation activities.
				Resident	Adult	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply.
					Child	Ingestion	Quant	Receptor could ingest groundwater used as a water supply.
						Dermal Absorption	Quant	Receptor could come into contact with groundwater used as a water supply.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to groundwater. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Upward Migration of Vapors from Groundwater (Outdoors)[2]	Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air.[2]
				Construction Worker	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air.
				Resident	Adult	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.[2]
					Child	Inhalation	None	Receptor is not likely to inhale vapors that migrated upward from groundwater to ambient air in any significant quantities.[2]
			Upward Migration of Vapors from Groundwater (Indoors)[2]	Commercial/Industrial Worker	Adult	Inhalation	None	Receptor not likely inhale VOCs from groundwater via vapor intrusion into building.[2]
				Construction Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Resident	Adult	Inhalation	None	Receptor not likely inhale VOCs from groundwater via vapor intrusion into residence.[2]
					Child	Inhalation	None	Receptor not likely to inhale VOCs from groundwater via vapor intrusion into residence.[2]
			Vapors while Showering[2]	Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed not to shower on-site.
				Resident	Adult	Inhalation	None	Receptor is not likely inhale vapors from groundwater while showering.[2]
					Child	Inhalation	None	Receptor is assumed not to shower.

Notes:
[1] Groundwater from the surface aquifer is not currently used at the sites for potable or non-potable water supply.
[2] VOCs are not chemicals of interest for the site; therefore, the vapors pathway is not assessed quantitatively.

Table E.2-2.1
Area B COPC Determination - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Surface Soil		**TAL Metals**														
	7429-90-5	Aluminum	8,690	22,600	mg/kg	54SB49A	17/17	2.3 - 7.1	22,600	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.44	1.9	mg/kg	54SB46A (E)	7/15	0.14 - 0.68	1.9	3.13	N	40.88	N	IND	N	BSL
	7440-38-2	Arsenic	0.44	5.1	mg/kg	54SB46A (E)	17/17	0.27 - 0.46	5.1	0.426	C	1.91	C	IND	Y	***ARES/IND***
	7440-39-3	Barium	91.9	241	mg/kg	54SB51A	17/17	0.02 - 0.04	241	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.61	1.1	mg/kg	54SB49A	17/17	0.01 - 0.03	1.1	15.64	N	204.4	N	IND	N	BSL
	7440-43-9	Cadmium	0.05	0.64	mg/kg	54SB46A (E)	3/17	0.03 - 0.07	0.64	7.821	N	102.2	N	IND	N	BSL
	7440-70-2	Calcium	636	14,900	mg/kg	54SB46A (E)	17/17	1 - 1.9	14,900	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium [1]	14.8	41.6	mg/kg	54SB49A	17/17	0.06 - 0.11	41.6	23.46	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	6.1	12.2	mg/kg	54SB49A	17/17	0.06 - 0.11	12.2	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	3.3	195	mg/kg	54SB46A (E)	17/17	0.15 - 0.26	195	312.9	N	4,088	N	IND	N	BSL
	7439-89-6	Iron	13,200	35,100	mg/kg	54SB49A	17/17	1.4 - 2.5	35,100	5,475	N	71,540	N	IND	Y	**ARES**
	7439-92-1	Lead [2]	7.4	3,610	mg/kg	54SB46A (E)	17/17	0.14 - 0.42	3,610	400	--	750	--	USEPA	Y	***ARES/IND***
	7439-95-4	Magnesium	1,120	9,040	mg/kg	54SB46A (E)	17/17	0.65 - 1.5	9,040	--	--	156,400	--	RDA	N	BSL
	7439-96-5	Manganese	296	883.5	mg/kg	54SB42A DUP AVG (C)	17/17	0.02 - 0.04	883.5	156.4	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury [3]	0.02	0.77	mg/kg	54SB46A (E)	17/17	0.018 - 0.031	0.77	2.3	--	31	--	IND	N	BSL
	7440-02-0	Nickel	7	19.3	mg/kg	54SB49A	17/17	0.11 - 0.18	19.3	156.4	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	749	2,880	mg/kg	54SB49A	17/17	4.5 - 21.7	2,880	--	--	2,607,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.56	2.6	mg/kg	54SB49A	17/17	0.34 - 0.6	2.6	39.11	N	511	N	IND	N	BSL
	7440-22-4	Silver	0.11	0.11	mg/kg	54SB46A (E)	1/17	0.07 - 0.13	0.11	39.11	N	511	N	IND	N	BSL
	7440-23-5	Sodium	67.6	1,270	mg/kg	54SB49A	16/17	26.6 - 45.5	1,270	--	--	625,700	--	RDA	N	BSL
	7440-62-2	Vanadium	23	58.9	mg/kg	54SB49A	17/17	0.07 - 0.13	58.9	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	47.1	555	mg/kg	54SB46A (E)	17/17	0.11 - 0.18	555	2,346	N	30,660	N	IND	N	BSL
		TCL Pesticides/PCBs														
	72-55-9	4,4'-DDE	7.6E-03	6.0E-02	mg/kg	54SB46A (E)	2/10	0.0004 - 0.00392	6.0E-02	1.9E+00	C	8.4E+00	C	IND	N	BSL
	5103-71-9	alpha-Chlordane [4]	6.2E-02	6.2E-02	mg/kg	54SB46A (E)	1/10	0.00022 - 0.00305	6.2E-02	1.8E+00	C	8.2E+00	C	IND	N	BSL
	319-86-8	delta-BHC [5]	6.0E-03	6.0E-03	mg/kg	54SB49A	1/10	0.00015 - 0.00265	6.0E-03	1.0E-01	C	4.5E-01	C	IND	N	BSL
	60-57-1	Dieldrin	1.1E-02	1.1E-02	mg/kg	54SB46A (E)	1/10	0.00043 - 0.0032	1.1E-02	4.0E-02	C	1.8E-01	C	IND	N	BSL
	7421-93-4	Endrin aldehyde [6]	4.4E-03	4.4E-03	mg/kg	54SB73A	1/10	0.00035 - 0.00295	4.4E-03	2.3E+00	N	3.1E+01	N	IND	N	BSL
	53494-70-5	Endrin ketone [6]	7.5E-03	7.5E-03	mg/kg	54SB49A	1/10	0.00039 - 0.00311	7.5E-03	2.3E+00	N	3.1E+01	N	IND	N	BSL
	5103-74-2	gamma-Chlordane [4]	5.5E-02	5.5E-02	mg/kg	54SB46A (E)	1/10	0.00035 - 0.00311	5.5E-02	1.8E+00	C	8.2E+00	C	IND	N	BSL
	76-44-8	Heptachlor	1.3E-03	1.3E-03	mg/kg	54SB46A (E)	1/10	0.00034 - 0.00335	1.3E-03	1.4E-01	C	6.4E-01	C	IND	N	BSL
	1024-57-3	Heptachlor epoxide	5.9E-03	2.1E-02	mg/kg	54SB46A (E)	2/10	0.00026 - 0.00471	2.1E-02	7.0E-02	C	3.1E-01	C	IND	N	BSL
	72-43-5	Methoxychlor	3.0E-03	3.0E-03	mg/kg	54SB49A	1/10	0.0014 - 0.00634	3.0E-03	3.9E+01	N	5.1E+02	N	IND	N	BSL
	11097-69-1	Aroclor 1254 [7]	1.5E-02	2.8E+00	mg/kg	54SB46A (E)	5/10	0.0072 - 0.073	2.8E+00	1.6E-01	C	1.4E+00	C	IND	Y	***ARES/IND***
	11096-82-5	Aroclor 1260	2.4E-02	3.8E-01	mg/kg	54SB46A (E)	2/10	0.0053 - 0.0141	3.8E-01	3.2E-01	C	1.4E+00	C	IND	Y	**ARES**
		TCL SVOCs														
	121-14-2	2,4-Dinitrotoluene	1.5E-01	1.4E+01	mg/kg	54SB46A (E)	4/17	0.02 - 0.02	1.4E+01	1.6E+01	N	2.0E+02	N	IND	N	BSL
	606-20-2	2,6-Dinitrotoluene	2.5E-02	2.1E+00	mg/kg	54SB46A (E)	4/17	0.021 - 0.021	2.1E+00	7.8E+00	N	1.0E+02	N	IND	N	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	5.0E-02	1.4E+00	mg/kg	54SB46A (E)	10/17	0.032 - 0.032	1.4E+00	4.6E+01	C	2.0E+02	C	IND	N	BSL
	84-74-2	Di-n-butylphthalate	4.4E-02	1.1E+01	mg/kg	54SB46A (E)	6/17	0.38 - 6	1.1E+01	7.8E+02	N	1.0E+04	N	IND	N	BSL
	84-66-2	Diethylphthalate	3.6E-02	9.6E+01	mg/kg	54SB46A (E)	9/17	0.38 - 6	9.6E+01	6.3E+03	N	8.2E+04	N	IND	N	BSL
	131-11-3	Dimethylphthalate	1.2E+00	1.9E+00	mg/kg	54SB46A (E)	2/17	0.38 - 6	1.9E+00	--	--	--	--	--	Y	NSV
	86-30-6	N-Nitrosodiphenylamine	1.1E-01	1.8E+00	mg/kg	54SB46A (E)	4/17	0.38 - 6	1.8E+00	1.3E+02	C	5.8E+02	C	IND	N	BSL
		Dioxin/Furans														
	--	Total 2,3,7,8-TCDD Equivalents	6.4E-08	1.8E-04	mg/kg	54SB49A	18/18	--	1.8E-04	4.3E-06	--	1.9E-05	--	IND	Y	***ARES/IND***
		PAHs														
	83-32-9	Acenaphthene	3.4E-02	3.5E+00	mg/kg	54SB43A (F)	5/17	0.0058 - 0.0059	3.5E+00	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene [8]	2.4E-01	2.4E-01	mg/kg	54SB49A	1/17	0.0059 - 0.0059	2.4E-01	2.3E+02	N	3.1E+03	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	5.6E-03	1.5E-02	mg/kg	54SB49A	3/17	0.0022 - 0.0022	1.5E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	50-32-8	Benzo(a)pyrene	6.9E-03	5.7E-02	mg/kg	54SB49A	3/17	0.0016 - 0.0016	5.7E-02	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	205-99-2	Benzo(b)fluoranthene	5.0E-03	1.0E-01	mg/kg	54SB49A	7/17	0.0017 - 0.0017	1.0E-01	2.2E-01	C	3.9E+00	C	IND	N	BSL
	191-24-2	Benzo(g,h,i)perylene [8]	6.5E-03	8.4E-02	mg/kg	54SB50A (D)	2/17	0.0036 - 0.0036	8.4E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	6.7E-03	3.2E-02	mg/kg	54SB49A	3/17	0.0014 - 0.0036	3.2E-02	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	1.3E-02	4.2E-02	mg/kg	54SB49A	3/17	0.0014 - 0.0024	4.2E-02	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	8.9E-03	8.9E-03	mg/kg	54SB43A (F)	1/17	0.0024 - 0.0042	8.9E-03	2.2E-02	C	3.9E-01	C	IND	N	BSL
	206-44-0	Fluoranthene	4.3E-03	7.2E-02	mg/kg	54SB49A	8/17	0.0021 - 0.0042	7.2E-02	3.1E+02	N	4.1E+03	N	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	3.5E-02	3.5E-02	mg/kg	54SB43A (F)	1/17	0.0025 - 0.014	3.5E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	91-20-3	Naphthalene	8.9E-02	8.6E+00	mg/kg	54SB49A	5/17	0.0025 - 0.014	8.6E+00	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene [8]	2.1E-02	2.5E-02	mg/kg	54SB49A	2/17	0.0085 - 0.0085	2.5E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	1.0E-02	6.5E-02	mg/kg	54SB50A (D)	8/17	0.0043 - 0.0043	6.5E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL

Table E.2-2.1
Area B COPC Determination - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
		Explosives														
	99-35-4	1,3,5-Trinitrobenzene	1.9E+00	1.9E+00	mg/kg	54SB49A	1/1	0.079 - 0.079	1.9E+00	2.3E+02	N	3.1E+03	N	IND	N	BSL
	118-96-7	2,4,6-Trinitrotoluene[9]	4.5E-01	8.0E+01	mg/kg	54SB49A	3/17	0.16 - 0.16	8.0E+01	3.9E+00	N	5.1E+01	N	IND	Y	***ARES/IND***
	121-14-2	2,4-Dinitrotoluene	3.8E-01	1.1E+01	mg/kg	54SB46A (E)	2/17	0.12 - 0.12	1.1E+01	1.6E+01	N	2.0E+02	N	IND	N	BSL
	--	Dinitrotoluene Mix	3.8E-01	1.1E+01	mg/kg	54SB46A (E)	2/17	--	1.1E+01	9.4E-01	N	4.2E+00	N	IND	Y	***ARES/IND***
	35572-78-2	2-Amino-4,6-Dinitrotoluene	9.6E+00	9.6E+00	mg/kg	54SB46A (E)	1/17	0.1 - 0.1	9.6E+00	1.6E+01	N	2.0E+02	N	IND	N	BSL
	1946-51-0	4-Amino-2,6-Dinitrotoluene	1.4E+01	1.4E+01	mg/kg	54SB46A (E)	1/17	0.095 - 0.095	1.4E+01	1.6E+01	N	2.0E+02	N	IND	N	BSL
	--	Aminodinitrotoluenes	2.3E+01	2.3E+01	mg/kg	54SB46A (E)	1/17	--	2.3E+01	1.6E+01	N	2.0E+02	N	IND	Y	**ARES**
	121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	8.2E+00	8.2E+00	mg/kg	54SB49A	1/17	0.28 - 0.28	8.2E+00	5.8E+00	C	2.6E+01	C	IND	Y	**ARES**
		Nitroglycerin														
	55-63-0	Nitroglycerin	9.5E+01	4.0E+02	mg/kg	54SB46A (E)	2/17	0.1 - 1	4.0E+02	7.8E-01	N	1.0E+01	N	IND	Y	***ARES/IND***

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RBC = USEPA Region III Risk-Based Concentration
(RBC) values from the October 11, 2007,
RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
N/C = Noncarcinogenic/Carcinogenic per EPA RBC Table (October 2007)
[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Chlordane RBC value was used
[5] = Alpha-BHC RBC value was used
[6] = Endrin RBC value was used
[7] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[8] = Pyrene RBC value was used
[9] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

(C) = Re-sampled; Pesticides, PCBs, and Dioxin/Furans analyzed January 2007.
(D) = Re-sampled; Dioxin/Furans analyzed January 2007.
(E) = Re-sampled; PCBs and PCB Congeners analyzed January 2007.
(F) = Re-sampled; PCBs, PCB Congeners, and Dioxin/Furans analyzed January 2007.

ARAR = Applicable, Relevant, and Appropriate Requirement
USEPA = U.S. Environmental Protection Agency
TBC = To-Be-Considered
RDA = Recommended Daily Allowance
IND = Adjusted Industrial RBC
AL = USEPA Action Level

ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

Table E.2-2.2
Area B COPC Determination - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Total Soil
Exposure Medium:	Total Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Total Soil		**TAL Metals**														
	7429-90-5	Aluminum	6,910	22,600	mg/kg	54SB49A	37/37	2.2 - 7.1	22,600	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.33	20.7	mg/kg	54SB46B	13/30	0.12 - 0.68	20.7	3.13	N	40.88	N	IND	Y	**ARES**
	7440-38-2	Arsenic	0.35	5.1	mg/kg	54SB46A (E)	36/37	0.25 - 0.46	5.1	0.426	C	1.91	C	IND	Y	***ARES/IND***
	7440-39-3	Barium	50.4	245	mg/kg	54SB46B	37/37	0.02 - 0.04	245	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.42	1.1	mg/kg	54SB49A	37/37	0.01 - 0.03	1.1	15.6	N	204.4	N	IND	N	BSL
	7440-43-9	Cadmium	0.05	0.74	mg/kg	54SB46B	4/37	0.03 - 0.07	0.74	7.82	N	102.2	N	IND	N	BSL
	7440-70-2	Calcium	313	33,900	mg/kg	54SB46B	37/37	0.97 - 1.9	33,900	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium [1]	10.9	41.6	mg/kg	54SB49A	37/37	0.06 - 0.11	41.6	23.46	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	4.5	12.2	mg/kg	54SB49A	37/37	0.06 - 0.11	12.2	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	0.39	320	mg/kg	54SB46B	35/35	0.14 - 0.26	320	312.9	N	4,088	N	IND	Y	**ARES**
	7439-89-6	Iron	11,600	35,100	mg/kg	54SB49A	37/37	1.2 - 2.5	35,100	5,475	N	71,540	N	IND	Y	**ARES**
	7439-92-1	Lead [2]	4	3,610	mg/kg	54SB46A (E)	37/37	0.12 - 0.42	3,610	400	--	750	--	USEPA	Y	***ARES/IND***
	7439-95-4	Magnesium	1,120	18,500	mg/kg	54SB46B	37/37	0.61 - 1.5	18,500	--	--	156,400	--	RDA	N	BSL
	7439-96-5	Manganese	159	883.5	mg/kg	54SB42A DUP AVG (C)	37/37	0.02 - 0.04	883.5	156.4	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury [3]	0.018	0.8	mg/kg	54SB46B	32/37	0.016 - 0.031	0.8	2.3	--	31	--	IND	N	BSL
	7440-02-0	Nickel	7	21.60	mg/kg	54SB46B	37/37	0.1 - 0.18	21.6	156.4	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	627	2,910	mg/kg	54SB42B (C)	37/37	3.9 - 21.7	2,910	--	--	2,607,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.52	2.6	mg/kg	54SB49A	37/37	0.3 - 0.6	2.6	39.11	N	511	N	IND	N	BSL
	7440-22-4	Silver	0.11	0.2	mg/kg	54SB46B	2/37	0.07 - 0.13	0.2	39.11	N	511	N	IND	N	BSL
	7440-23-5	Sodium	67.6	1,270	mg/kg	54SB49A	36/37	25.1 - 45.5	1,270	--	--	625,700	--	RDA	N	BSL
	7440-62-2	Vanadium	18.8	58.9	mg/kg	54SB49A	37/37	0.07 - 0.13	58.9	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	26.5	762	mg/kg	54SB46B	37/37	0.1 - 0.18	762	2,346	N	30,660	N	IND	N	BSL
		TCL Pesticides/PCBs														
	72-55-9	4,4'-DDE	7.6E-03	6.0E-02	mg/kg	54SB46A (E)	3/27	0.0004 - 0.0041	6.0E-02	1.9E+00	C	8.4E+00	C	IND	N	BSL
	309-00-2	Aldrin	4.4E-03	4.4E-03	mg/kg	54SB46B	1/27	0.00017 - 0.0032	4.4E-03	3.8E-02	C	1.7E-01	C	IND	N	BSL
	319-84-6	alpha-BHC	8.3E-04	8.3E-04	mg/kg	54SB48B	1/27	0.00026 - 0.00359	8.3E-04	1.0E-01	C	4.5E-01	C	IND	N	BSL
	5103-71-9	alpha-Chlordane [4]	6.2E-02	4.9E-01	mg/kg	54SB46B	2/27	0.00022 - 0.00319	4.9E-01	1.8E+00	C	8.2E+00	C	IND	N	BSL
	319-85-7	beta-BHC	3.5E-03	3.5E-03	mg/kg	54SB48B	1/27	0.00028 - 0.00445	3.5E-03	3.5E-01	C	1.6E+00	C	IND	N	BSL
	319-86-8	delta-BHC [5]	1.2E-03	6.0E-03	mg/kg	54SB49A	2/27	0.00015 - 0.00276	6.0E-03	1.0E-01	C	4.5E-01	C	IND	N	BSL
	60-57-1	Dieldrin	1.1E-02	1.1E-02	mg/kg	54SB46A (E)	1/27	0.00043 - 0.00334	1.1E-02	4.0E-02	C	1.8E-01	C	IND	N	BSL
	7421-93-4	Endrin aldehyde [6]	2.7E-03	5.6E-03	mg/kg	54SB73B	3/27	0.00035 - 0.00308	5.6E-03	2.3E+00	N	3.1E+01	N	IND	N	BSL
	53494-70-5	Endrin ketone [6]	7.5E-03	7.5E-03	mg/kg	54SB49A	1/27	0.00039 - 0.00324	7.5E-03	2.3E+00	N	3.1E+01	N	IND	N	BSL
	58-89-9	gamma-BHC (Lindane)	1.1E-03	1.1E-03	mg/kg	54SB48B	1/27	0.00022 - 0.00372	1.1E-03	4.9E-01	C	2.2E+00	C	IND	N	BSL
	5103-74-2	gamma-Chlordane [4]	5.5E-02	6.3E-02	mg/kg	54SB46B	2/27	0.00035 - 0.00324	6.3E-02	1.8E+00	C	8.2E+00	C	IND	N	BSL
	76-44-8	Heptachlor	1.3E-03	2.8E-03	mg/kg	54SB46B	2/27	0.00034 - 0.00349	2.8E-03	1.4E-01	C	6.4E-01	C	IND	N	BSL
	1024-57-3	Heptachlor epoxide	2.6E-03	5.3E-01	mg/kg	54SB46B	5/27	0.00026 - 0.00491	5.3E-01	7.0E-02	C	3.1E-01	C	IND	Y	***ARES/IND***
	72-43-5	Methoxychlor	3.0E-03	3.0E-03	mg/kg	54SB49A	1/27	0.0014 - 0.00662	3.0E-03	3.9E+01	N	5.1E+02	N	IND	N	BSL
	11097-69-1	Aroclor 1254 [7]	8.0E-03	2.8E+00	mg/kg	54SB46A (E)	9/28	0.0068 - 0.075	2.8E+00	1.6E-01	C	1.4E+00	C	IND	Y	***ARES/IND***
	11096-82-5	Aroclor 1260	2.4E-02	5.1E-01	mg/kg	54SB46C (C)	5/28	0.0052 - 0.0141	5.1E-01	3.2E-01	C	1.4E+00	C	IND	Y	**ARES**
		TCL SVOCs														
	117-81-7	Bis(2-ethylhexyl)phthalate	4.0E-02	1.9E+00	mg/kg	54SB46B	16/37	0.032 - 0.032	1.9E+00	4.6E+01	C	2.0E+02	C	IND	N	BSL
	86-74-8	Carbazole	4.2E-02	4.2E-02	mg/kg	54SB46B	1/36	0.029 - 0.029	4.2E-02	3.2E+01	C	1.4E+02	C	IND	N	BSL
	84-74-2	Di-n-butylphthalate	4.4E-02	1.1E+01	mg/kg	54SB46A (E)	8/36	0.35 - 6	1.1E+01	7.8E+02	N	1.0E+04	N	IND	N	BSL
	117-84-0	Di-n-octylphthalate	6.4E-01	6.4E-01	mg/kg	54SB46C (C)	1/37	0.35 - 6	6.4E-01	--	--	--	--	--	Y	NSV
	84-66-2	Diethylphthalate	3.6E-02	9.6E+01	mg/kg	54SB46A (E)	12/36	0.35 - 6	9.6E+01	6.3E+03	N	8.2E+04	N	IND	N	BSL
	131-11-3	Dimethylphthalate	8.4E-02	1.9E+00	mg/kg	54SB46A (E)	4/36	0.35 - 6	1.9E+00	--	--	--	--	--	Y	NSV
	86-30-6	N-Nitrosodiphenylamine	2.9E-02	1.8E+00	mg/kg	54SB46A (E)	6/36	0.35 - 6	1.8E+00	1.3E+02	C	5.8E+02	C	IND	N	BSL
		Dioxin/Furans														
	--	Total 2,3,7,8-TCDD Equivalents	7.0E-09	1.8E-04	mg/kg	54SB49A	51/51	--	1.8E-04	4.3E-06	--	1.9E-05	--	IND	Y	***ARES/IND***
		PAHs														
	83-32-9	Acenaphthene	2.6E-02	2.0E+01	mg/kg	54SB44B	10/37	0.0058 - 0.0059	2.0E+01	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene [6]	1.6E-02	3.4E-01	mg/kg	54SB44B	3/37	0.0059 - 0.0059	3.4E-01	2.3E+02	N	3.1E+03	N	IND	N	BSL
	120-12-7	Anthracene	7.2E-03	2.6E-02	mg/kg	54SB46B	3/37	0.0054 - 0.0054	2.6E-02	2.3E+03	N	3.1E+04	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	5.6E-03	5.5E-02	mg/kg	54SB46B	7/37	0.0022 - 0.0022	5.5E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	50-32-8	Benzo(a)pyrene	5.8E-03	7.4E-02	mg/kg	54SB52B	8/37	0.0016 - 0.0016	7.4E-02	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	205-99-2	Benzo(b)fluoranthene	5.0E-03	1.0E-01	mg/kg	54SB49A	12/37	0.0017 - 0.0017	1.0E-01	2.2E-01	C	3.9E+00	C	IND	N	BSL
	191-24-2	Benzo(g,h,i)perylene [6]	6.5E-03	8.4E-02	mg/kg	54SB50A (D)	5/37	0.0036 - 0.0036	8.4E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	6.7E-03	1.4E-01	mg/kg	54SB46B	7/37	0.0014 - 0.0036	1.4E-01	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	9.0E-03	6.1E-02	mg/kg	54SB46B	7/37	0.0014 - 0.0024	6.1E-02	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	8.9E-03	1.8E-02	mg/kg	54SB46B	3/37	0.0024 - 0.0042	1.8E-02	2.2E-02	C	3.9E-01	C	IND	N	BSL

Table E.2-2.2
Area B COPC Determination - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
	206-44-0	Fluoranthene	4.3E-03	1.6E-01	mg/kg	54SB46B	12/37	0.0021 - 0.0042	1.6E-01	3.1E+02	N	4.1E+03	N	IND	N	BSL
	86-73-7	Fluorene	1.3E-02	7.3E-02	mg/kg	54SB44B	3/37	0.0021 - 0.014	7.3E-02	3.1E+02	N	4.1E+03	N	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	5.1E-03	1.0E-01	mg/kg	54SB46B	6/37	0.0025 - 0.014	1.0E-01	2.2E-01	C	3.9E+00	C	IND	N	BSL
	91-20-3	Naphthalene	8.4E-02	8.6E+00	mg/kg	54SB49A	10/37	0.0025 - 0.014	8.6E+00	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene [6]	1.2E-02	9.4E-02	mg/kg	54SB46B	5/37	0.0085 - 0.0085	9.4E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	7.6E-03	1.6E-01	mg/kg	54SB46B	19/37	0.0043 - 0.0043	1.6E-01	2.3E+02	N	3.1E+03	N	IND	N	BSL
		Explosives														
	99-35-4	1,3,5-Trinitrobenzene	1.9E+00	1.9E+00	mg/kg	54SB49A	1/1	0.079 - 0.079	1.9E+00	2.3E+02	N	3.1E+03	N	IND	N	BSL
	118-96-7	2,4,6-Trinitrotoluene [9]	4.5E-01	8.0E+01	mg/kg	54SB49A	4/37	0.16 - 0.16	8.0E+01	3.9E+00	N	5.1E+01	N	IND	Y	***ARES/IND***
	121-14-2	2,4-Dinitrotoluene	3.8E-01	1.6E+02	mg/kg	54SB46B	3/37	0.12 - 0.12	1.6E+02	1.6E+01	N	2.0E+02	N	IND	Y	**ARES**
	--	Dinitrotoluene Mix	3.8E-01	1.6E+02	mg/kg	54SB46B	3/37	0.12 - 0.12	1.6E+02	9.4E-01	N	4.2E+00	N	IND	Y	***ARES/IND***
	35572-78-2	2-Amino-4,6-Dinitrotoluene	9.6E+00	3.5E+01	mg/kg	54SB46B	2/37	0.1 - 0.1	3.5E+01	1.6E+01	N	2.0E+02	N	IND	Y	**ARES**
	1946-51-0	4-Amino-2,6-Dinitrotoluene	1.4E+01	3.1E+01	mg/kg	54SB46B	2/37	0.095 - 0.095	3.1E+01	1.6E+01	N	2.0E+02	N	IND	Y	**ARES**
	--	Aminodinitrotoluenes	2.3E+01	6.6E+01	mg/kg	54SB46B	2/37	--	6.6E+01	1.6E+01	N	2.0E+02	N	IND	Y	**ARES**
	2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	1.1E+02	1.1E+02	mg/kg	54SB46B	1/37	0.1 - 0.1	1.1E+02	3.9E+02	N	5.1E+03	N	IND	N	BSL
	121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	8.2E+00	8.2E+00	mg/kg	54SB49A	1/37	0.28 - 0.28	8.2E+00	5.8E+00	C	2.6E+01	C	IND	Y	**ARES**
		Nitroglycerin														
	55-63-0	Nitroglycerin	9.5E+01	4.0E+02	mg/kg	54SB46A (E)	2/37	0.1 - 1	4.0E+02	7.8E-01	N	1.0E+01	N	IND	Y	***ARES/IND***

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RBC = USEPA Region III Risk-Based Concentration
(RBC) values from the October 11, 2007,
RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
N/C = Noncarcinogenic/Carcinogenic per EPA RBC Table (October 2007)
[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Chlordane RBC value was used
[5] = Alpha-BHC RBC value was used
[6] = Endrin RBC value was used
[7] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[8] = Pyrene RBC value was used
[9] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

[C] = Re-sampled; Pesticides, PCBs, and Dioxin/Furans analyzed January 2007.
[D] = Re-sampled; Dioxin/Furans analyzed January 2007.
[E] = Re-sampled; PCBs and PCB Congeners analyzed January 2007.
[F] = Re-sampled; PCBs, PCB Congeners, and Dioxin/Furans analyzed January 2007.

USEPA = U.S. Environmental Protection Agency
ARAR = Applicable, Relevant, and Appropriate Requirement
TBC = To-Be-Considered
RDA = Recommended Daily Allowance
IND = Adjusted Industrial RBC
AL = USEPA Action Level

ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

Table E.2-2.3
Non-detected Chemicals MDL Screening for Area B - Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
TAL Metals							
ANTIMONY	7440-36-0	mg/kg	26	0.37	0.49	3.13	N
ARSENIC	7440-38-2	mg/kg	1	0.25	0.25	0.426	N
CADMIUM	7440-43-9	mg/kg	35	0.03	0.07	3.91	N
COPPER	7440-50-8	mg/kg	2	0.16	0.17	312.9	N
MERCURY[1]	7439-97-6	mg/kg	6	0.016	0.02	--	NS
SILVER	7440-22-4	mg/kg	37	0.07	0.13	39.11	N
SODIUM	7440-23-5	mg/kg	1	35	35	--	NS
THALLIUM	7440-28-0	mg/kg	39	0.24	0.93	0.548	**Y**
Pesticides/PCBs							
4,4'-DDD	72-54-8	ug/kg	27	0.32	3.39	2.7E+03	N
4,4'-DDE	72-55-9	ug/kg	24	0.4	4.1	1.9E+03	N
4,4'-DDT	50-29-3	ug/kg	27	0.39	3.82	1.9E+03	N
ALDRIN	309-00-2	ug/kg	26	0.17	3.2	3.8E+01	N
ALPHA-BHC	319-84-6	ug/kg	26	0.26	3.59	1.0E+02	N
ALPHA-CHLORDANE[2]	5103-71-9	ug/kg	25	0.22	3.19	1.8E+03	N
BETA-BHC	319-85-7	ug/kg	26	0.28	4.45	3.5E+02	N
DELTA-BHC[3]	319-86-8	ug/kg	25	0.15	2.76	1.0E+02	N
DIELDRIN	60-57-1	ug/kg	26	0.43	3.34	4.0E+01	N
ENDOSULFAN I[4]	959-98-8	ug/kg	27	0.43	3.72	4.7E+04	N
ENDOSULFAN II[4]	33213-65-9	ug/kg	27	0.58	2.24	4.7E+04	N
ENDOSULFAN SULFATE[4]	1031-07-8	ug/kg	27	0.4	3.81	4.7E+04	N
ENDRIN	72-20-8	ug/kg	27	0.35	3.55	2.3E+03	N
ENDRIN ALDEHYDE[5]	7421-93-4	ug/kg	24	0.35	3.08	2.3E+03	N
ENDRIN KETONE[5]	53494-70-5	ug/kg	26	0.39	3.24	2.3E+03	N
GAMMA-BHC (LINDANE)	58-89-9	ug/kg	26	0.22	3.72	4.9E+02	N
GAMMA-CHLORDANE[2]	5103-74-2	ug/kg	25	0.35	3.24	1.8E+03	N
HEPTACHLOR	76-44-8	ug/kg	25	0.34	3.49	1.4E+02	N
HEPTACHLOR EPOXIDE	1024-57-3	ug/kg	22	0.26	4.91	7.0E+01	N
METHOXYCHLOR	72-43-5	ug/kg	26	1.4	6.62	3.9E+04	N
TOXAPHENE	8001-35-2	ug/kg	27	18	97.3	5.8E+02	N
AROCLOR 1016	12674-11-2	ug/kg	28	5.1	15	5.5E+02	N
AROCLOR 1221	11104-28-2	ug/kg	28	9.4	15	3.2E+02	N
AROCLOR 1232	11141-16-5	ug/kg	28	5.4	11.6	3.2E+02	N
AROCLOR 1242	53469-21-9	ug/kg	28	5.6	10	3.2E+02	N
AROCLOR 1248	12672-29-6	ug/kg	28	4.4	9.1	3.2E+02	N
AROCLOR 1254[6]	11097-69-1	ug/kg	19	6.8	9.52	1.6E+02	N
AROCLOR 1260	11096-82-5	ug/kg	23	5.2	14.1	3.2E+02	N
SVOCs							
1,1'-BIPHENYL	92-52-4	ug/kg	39	22	22	3.9E+05	N
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	ug/kg	39	30	30	9.1E+03	N
2,4,5-TRICHLOROPHENOL	95-95-4	ug/kg	39	49	49	7.8E+05	N
2,4,6-TRICHLOROPHENOL	88-06-2	ug/kg	39	50	50	7.8E+03	N
2,4-DICHLOROPHENOL	120-83-2	ug/kg	39	22	22	2.3E+04	N
2,4-DIMETHYLPHENOL	105-67-9	ug/kg	39	30	30	1.6E+05	N
2,4-DINITROPHENOL	51-28-5	ug/kg	39	170	170	1.6E+04	N
2,4-DINITROTOLUENE	121-14-2	mg/kg	36	20	20	1.6E+04	N
2,6-DINITROTOLUENE	606-20-2	mg/kg	39	21	21	7.8E+03	N
2-CHLORONAPHTHALENE	91-58-7	ug/kg	39	22	22	6.3E+05	N
2-CHLOROPHENOL	95-57-8	ug/kg	39	18	18	3.9E+04	N
2-METHYLNAPHTHALENE	91-57-6	ug/kg	39	24	24	3.1E+04	N
2-METHYLPHENOL	95-48-7	ug/kg	39	27	27	3.9E+05	N
2-NITROANILINE	88-74-4	ug/kg	39	29	29	--	NS
2-NITROPHENOL	88-75-5	ug/kg	39	26	26	--	NS
3,3'-DICHLOROBENZIDINE	91-94-1	ug/kg	39	29	29	1.4E+03	N
3-NITROANILINE	99-09-2	ug/kg	39	34	34	--	NS
4,6-DINITRO-2-METHYLPHENOL	534-52-1	ug/kg	39	35	35	--	NS
4-BROMOPHENYL PHENYL ETHER	101-55-3	ug/kg	39	350	6,000	--	NS
4-CHLORO-3-METHYLPHENOL	59-50-7	ug/kg	39	29	29	--	NS
4-CHLOROANILINE	106-47-8	ug/kg	39	16	16	3.1E+04	N
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	ug/kg	39	350	6,000	--	NS
4-METHYLPHENOL	106-44-5	ug/kg	39	48	48	3.9E+04	N
4-NITROANILINE	100-01-6	ug/kg	39	39	39	--	NS
4-NITROPHENOL	100-02-7	ug/kg	39	75	75	--	NS
ACENAPHTHENE	83-32-9	ug/kg	39	31	31	4.7E+05	N
ACENAPHTHYLENE[7]	208-96-8	ug/kg	38	17	17	2.3E+05	N
ACETOPHENONE	98-86-2	ug/kg	39	23	23	7.8E+05	N
ANTHRACENE	120-12-7	ug/kg	38	25	25	2.3E+06	N
ATRAZINE	1912-24-9	ug/kg	39	16	16	2.9E+03	N
BENZALDEHYDE	100-52-7	ug/kg	39	39	39	7.8E+05	N
BENZO(A)ANTHRACENE	56-55-3	ug/kg	38	29	29	2.2E+02	N
BENZO(A)PYRENE	50-32-8	ug/kg	38	23	23	2.2E+01	**Y**

Table E.2-2.3
Non-detected Chemicals MDL Screening for Area B - Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
BENZO(B)FLUORANTHENE	205-99-2	ug/kg	38	36	36	2.2E+02	N
BENZO(G,H,I)PERYLENE[7]	191-24-2	ug/kg	38	23	23	2.3E+05	N
BENZO(K)FLUORANTHENE	207-08-9	ug/kg	38	29	29	2.2E+03	N
BIS(2-CHLOROETHOXY)METHANE	111-91-1	ug/kg	39	21	21	--	NS
BIS(2-CHLOROETHYL)ETHER	111-44-4	ug/kg	39	18	18	5.8E+02	N
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	ug/kg	23	32	32	4.6E+04	N
BUTYL BENZYL PHTHALATE	85-68-7	ug/kg	39	350	6,000	1.6E+06	N
CAPROLACTAM	105-60-2	ug/kg	39	62	62	3.9E+06	N
CARBAZOLE	86-74-8	ug/kg	38	29	29	3.2E+04	N
CHRYSENE	218-01-9	ug/kg	38	28	28	2.2E+04	N
DI-N-BUTYL PHTHALATE	84-74-2	ug/kg	30	350	430	7.8E+05	N
DI-N-OCTYL PHTHALATE	117-84-0	ug/kg	38	350	6,000	--	NS
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/kg	38	21	21	2.2E+01	N
DIBENZOFURAN	132-64-9	ug/kg	39	24	24	7.8E+03	N
DIETHYL PHTHALATE	84-66-2	ug/kg	26	350	430	6.3E+06	N
DIMETHYL PHTHALATE	131-11-3	ug/kg	35	350	1,600	--	NS
FLUORANTHENE	206-44-0	ug/kg	38	18	18	3.1E+05	N
FLUORENE	86-73-7	ug/kg	38	18	18	3.1E+05	N
HEXACHLOROBENZENE	118-74-1	ug/kg	39	22	22	4.0E+02	N
HEXACHLOROBUTADIENE	87-68-3	ug/kg	39	24	24	7.8E+03	N
HEXACHLOROCYCLOPENTADIENE	77-47-4	ug/kg	39	67	67	4.7E+04	N
HEXACHLOROETHANE	67-72-1	ug/kg	39	17	17	7.8E+03	N
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/kg	38	20	20	2.2E+02	N
ISOPHORONE	78-59-1	ug/kg	39	28	28	6.7E+05	N
N-NITROSODI-N-PROPYLAMINE	621-64-7	ug/kg	39	21	21	9.1E+01	N
N-NITROSODIPHENYLAMINE	86-30-6	ug/kg	32	350	430	1.3E+05	N
NAPHTHALENE	91-20-3	ug/kg	39	21	21	1.6E+05	N
NITROBENZENE	98-95-3	mg/kg	39	28	28	3.9E+03	N
PENTACHLOROPHENOL	87-86-5	ug/kg	39	46	46	5.3E+03	N
PHENOL	108-95-2	ug/kg	39	34	34	2.3E+06	N
PYRENE	129-00-0	ug/kg	38	24	24	2.3E+05	N
Dioxin/Furans							
1,2,3,4,6,7,8,9-OCDF (OCDF)	39001-02-0	pg/g	23	0.8	11.9	--	NS
1,2,3,4,6,7,8-HpCDD	35822-46-9	pg/g	3	0.5	5.12	--	NS
1,2,3,4,6,7,8-HpCDF	67562-39-4	pg/g	9	0.3	5.96	--	NS
1,2,3,4,7,8,9-HpCDF	55673-89-7	pg/g	39	0.3	5.96	--	NS
1,2,3,4,7,8-HxCDD	39227-28-6	pg/g	35	0.2	5.96	--	NS
1,2,3,4,7,8-HxCDF	70648-26-9	pg/g	33	0.2	5.96	--	NS
1,2,3,6,7,8-HxCDD	57653-85-7	pg/g	33	0.2	5.96	--	NS
1,2,3,6,7,8-HxCDF	57117-44-9	pg/g	30	0.1	5.96	--	NS
1,2,3,7,8,9-HxCDD	19408-74-3	pg/g	30	0.2	5.96	1.0E+02	N
1,2,3,7,8,9-HxCDF	72918-21-9	pg/g	40	0.2	5.96	--	NS
1,2,3,7,8-PeCDD	40321-76-4	pg/g	40	0.2	5.96	--	NS
1,2,3,7,8-PeCDF	57117-41-6	pg/g	26	0.1	5.12	--	NS
2,3,4,6,7,8-HxCDF	60851-34-5	pg/g	29	0.2	5.96	--	NS
2,3,4,7,8-PeCDF	57117-31-4	pg/g	14	0.1	0.492	--	NS
2,3,7,8-TCDD	1746-01-6	pg/g	34	0.0795	1.19	4.3E+00	N
2,3,7,8-TCDF	51207-31-9	pg/g	10	0.0869	0.3	--	NS
Total HpCDDs	--	pg/g	1	1.4	1.4	--	NS
Total HpCDFs	--	pg/g	14	0.3	5.96	--	NS
Total HxCDDs	--	pg/g	7	0.435	5.96	--	NS
Total HxCDFs	--	pg/g	13	0.2	5.56	--	NS
Total PeCDDs	--	pg/g	19	0.2	5.96	--	NS
Total PeCDFs	--	pg/g	9	0.2	0.493	--	NS
Total TCDDs	41903-57-5	pg/g	32	0.0795	1.19	--	NS
Total TCDFs	55722-27-5	pg/g	6	0.0869	0.3	--	NS
PAHs							
ACENAPHTHENE	83-32-9	ug/kg	29	5.8	5.9	4.7E+05	N
ACENAPHTHYLENE[7]	208-96-8	ug/kg	36	5.9	5.9	2.3E+05	N
ANTHRACENE	120-12-7	ug/kg	36	5.4	5.4	2.3E+06	N
BENZO(A)ANTHRACENE	56-55-3	ug/kg	32	2.2	2.2	2.2E+02	N
BENZO(A)PYRENE	50-32-8	ug/kg	31	1.6	1.6	2.2E+01	N
BENZO(B)FLUORANTHENE	205-99-2	ug/kg	27	1.7	1.7	2.2E+02	N
BENZO(G,H,I)PERYLENE[7]	191-24-2	ug/kg	34	3.6	3.6	2.3E+05	N
BENZO(K)FLUORANTHENE	207-08-9	ug/kg	32	1.4	1.4	2.2E+03	N
CHRYSENE	218-01-9	ug/kg	32	2.4	2.4	2.2E+04	N
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/kg	36	4.2	4.2	2.2E+01	N
FLUORANTHENE	206-44-0	ug/kg	27	2.1	2.1	3.1E+05	N
FLUORENE	86-73-7	ug/kg	36	14	14	3.1E+05	N
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/kg	33	2.5	2.5	2.2E+02	N
NAPHTHALENE	91-20-3	ug/kg	28	14	14	1.6E+05	N
PHENANTHRENE[7]	85-01-8	ug/kg	34	8.5	8.5	2.3E+05	N
PYRENE	129-00-0	ug/kg	20	4.3	4.3	2.3E+05	N

Table E.2-2.3
Non-detected Chemicals MDL Screening for Area B - Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted R-RBC	Maximum MDL Exceeds SL
PCB Congeners							
169-HxCB	32774-16-6	pg/g	2	8.13	8.32	--	NS
81-TeCB	70362-50-4	pg/g	1	8.13	8.13	--	NS
Explosives							
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	38	0.079	0.079	2.3E+02	N
1,3-DINITROBENZENE	99-65-0	mg/kg	39	0.097	0.097	7.8E-01	N
2,4,6-TRINITROTOLUENE[8]	118-96-7	mg/kg	35	0.16	0.16	3.9E+00	N
2,4-DINITROTOLUENE	121-14-2	mg/kg	36	0.12	0.12	1.6E+01	N
2,6-DINITROTOLUENE	606-20-2	mg/kg	39	0.19	0.19	7.8E+00	N
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	37	0.1	0.1	1.6E+01	N
2-NITROTOLUENE	88-72-2	mg/kg	39	0.16	0.16	7.8E+01	N
3-NITROTOLUENE	99-08-1	mg/kg	39	0.11	0.11	--	NS
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	mg/kg	37	0.095	0.095	1.6E+01	N
4-NITROTOLUENE	99-99-0	mg/kg	39	0.27	0.27	3.1E+01	N
HMX (OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TET)	2691-41-0	mg/kg	38	0.1	0.1	3.9E+02	N
NITROBENZENE	98-95-3	mg/kg	39	0.17	0.17	3.9E+00	N
RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	121-82-4	mg/kg	38	0.28	0.28	5.8E+00	N
TETRYL (METHYL-2,4,6-TRINITROPHENYLNITRAMINE)	479-45-8	mg/kg	39	0.4	0.4	3.1E+01	N
Nitroglycerin							
NITROGLYCERIN	55-63-0	mg/kg	37	0.1	1	7.8E-01	**Y**

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the Ocotber 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
R-RBC = Residential RBC

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available
SL = Screening Level
[1] = Mercuric chloride soil RBC value used
[2] = Chlordane RBC value was used
[3] = Alpha-BHC RBC value was used
[4] = Endosulfan RBC value was used
[5] = Endrin RBC value was used
[6] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[7] = Pyrene RBC value was used
[8] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

Table E.2-2.4
Area B Groundwater COPC Selection
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	C/N	Adjusted Tap Water RBC	MCL	COPC Flag (Y/N)	Rationale for Selection or Deletion
Perchlorate[B]													
Perchlorate	14797-73-0	0.1	0.1	ug/L	54MW6	1/3	0.08 - 0.08	0.1	N	3	24.5	N	BSL
TAL Metals[A]													
Aluminum	7429-90-5	145	222.5	ug/L	54MW7 DUP AVG	2/3	29.5 - 29.5	222.5	N	3,650	--	N	BSL
Aluminum, Dissolved	7429-90-5	15.25	15.25	ug/L	54MW7 DUP AVG	1/3	11.8 - 11.8	15.25	N	3,650	--	N	BSL
Barium	7440-39-3	16.3	74.4	ug/L	54MW6	3/3	0.2 - 0.2	74.4	N	730	2,000	N	BSL
Barium, Dissolved	7440-39-3	15.8	70.5	ug/L	54MW6	3/3	0.2 - 0.2	70.5	N	730	2,000	N	BSL
Calcium	7440-70-2	28,000	113,000	ug/L	54MW4	3/3	26.2 - 26.2	113,000	--	--	--	N	Nutrient
Calcium, Dissolved	7440-70-2	27,500	112,000	ug/L	54MW4	3/3	7.9 - 7.9	112,000	--	--	--	N	Nutrient
Chromium [1]	7440-47-3	1	5.4	ug/L	54MW7 DUP AVG	3/3	0.7 - 0.7	5.4	N	10.95	100	N	BSL
Chromium, Dissolved [1]	7440-47-3	0.825	1.6	ug/L	54MW6	2/3	0.6 - 0.6	1.6	N	10.95	100	N	BSL
Copper	7440-50-8	1	1.5	ug/L	54MW6	2/3	1.2 - 1.2	1.5	N	146	1,300	N	BSL
Iron	7439-89-6	128	951	ug/L	54MW6	3/3	15 - 15	951	N	2,555	--	N	BSL
Lead, Dissolved [2]	7439-92-1	0.875	1.6	ug/L	54MW6	2/3	1.1 - 1.1	1.6	--	15	--	N	BSL
Magnesium	7439-95-4	13,550	51,800	ug/L	54MW4	3/3	7.4 - 7.4	51,800	--	--	--	N	Nutrient
Magnesium, Dissolved	7439-95-4	11,650	50,000	ug/L	54MW4	3/3	5.3 - 5.3	50,000	--	--	--	N	Nutrient
Manganese	7439-96-5	1.1	94.65	ug/L	54MW7 DUP AVG	3/3	0.2 - 0.2	94.65	N	73	--	Y	**ARBC**
Manganese, Dissolved	7439-96-5	0.87	72.05	ug/L	54MW7 DUP AVG	3/3	0.2 - 0.2	72.05	N	73	--	N	BSL
Mercury, Dissolved [3]	7439-97-6	0.09	0.09	ug/L	54MW7 DUP AVG	1/3	0.1 - 0.1	0.09	N	0.37	2	N	BSL
Nickel	7440-02-0	3.2	4.65	ug/L	54MW7 DUP AVG	2/3	1.2 - 1.2	4.65	N	73	--	N	BSL
Nickel, Dissolved	7440-02-0	1.8	2.4	ug/L	54MW6	3/3	1 - 1	2.4	N	73	--	N	BSL
Potassium	7440-09-7	391.5	1,730	ug/L	54MW4	3/3	30.6 - 30.6	1,730	--	--	--	N	Nutrient
Potassium, Dissolved	7440-09-7	622	2,840	ug/L	54MW4	3/3	68.4 - 68.4	2,840	--	--	--	N	Nutrient
Selenium	7782-49-2	2.85	4.4	ug/L	54MW6	3/3	2.1 - 2.1	4.4	N	18.25	50	N	BSL
Selenium, Dissolved	7782-49-2	3.8	4.15	ug/L	54MW7 DUP AVG	2/3	2.6 - 2.6	4.15	N	18.25	50	N	BSL
Sodium	7440-23-5	2,830	8,590	ug/L	54MW7 DUP AVG	3/3	235 - 235	8,590	--	--	--	N	Nutrient
Sodium, Dissolved	7440-23-5	1,730	7,145	ug/L	54MW7 DUP AVG	3/3	99.3 - 99.3	7,145	--	--	--	N	Nutrient
Vanadium	7440-62-2	0.72	0.99	ug/L	54MW7 DUP AVG	2/3	0.7 - 0.7	0.99	N	3.65	--	N	BSL
Vanadium, Dissolved	7440-62-2	0.49	0.625	ug/L	54MW7 DUP AVG	2/3	0.4 - 0.4	0.625	N	3.65	--	N	BSL
Zinc	7440-66-6	2.55	7.3	ug/L	54MW4	2/3	0.6 - 0.6	7.3	N	1,095	--	N	BSL
Zinc, Dissolved	7440-66-6	3.4	10.4	ug/L	54MW7 DUP AVG	3/3	1 - 1	10.4	N	1,095	--	N	BSL
TCL SVOCs[A]													
Bis(2-ethylhexyl)phthalate	117-81-7	2	2	ug/L	54MW4	1/3	1 - 1	2	C	4.8E+00	6	N	BSL
Explosives[B]													
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5	2691-41-0	2.45	2.45	ug/L	54MW7 DUP AVG	1/3	0.2 - 0.2	2.45	N	1.8E+02	--	N	BSL

Notes:

CAS = Chemical Abstracts Service
µg/L = Microgram Per Liter
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semivolatile Organic Compound
TIC = Tentatively Identified Compound
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
C = Carcinogenic per EPA RBC Table (October 2007)
N = Noncarcinogenic per EPA RBC Table (October 2007)
MCL = Maximum Contaminant Level
BSL = Below Tap Water RBC/MCL
DUP AVG = results for duplicate samples averaged

ARBC = Above Tap Water RBC

[1] = Chromium VI RBC used for screening
[2] = USEPA Action Level used for screening
[3] = Methylmercury RBC used for screening

[A] = Data from 2003-2004 used in screening
[B] = Data from September 2007 used in screening

Table E.2-2.5
Area B Groundwater Non-Detects Screening
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted T-RBC	Maximum MDL Exceeds SL
Perchlorate							
PERCHLORATE	14797-73-0	ug/L	3	0.54	0.54	2.56	N
PERCHLORATE (2006)	14797-73-0	ug/L	3	1.84	1.84	2.56	N
PERCHLORATE (March 2007)	14797-73-0	ug/L	3	0.036	0.036	2.56	N
PERCHLORATE (June 2007)	14797-73-0	ug/L	3	0.08	0.08	2.56	N
PERCHLORATE (September 2007)	14797-73-0	ug/L	2	0.2	0.2	2.56	N
TAL Metals							
ALUMINUM	7429-90-5	ug/L	1	29.5	29.5	3,650	N
ALUMINUM, DISSOLVED	7429-90-5	ug/L	2	11.8	11.8	3,650	N
ANTIMONY	7440-36-0	ug/L	3	1.8	1.8	1.46	**Y**
ANTIMONY, DISSOLVED	7440-36-0	ug/L	3	2.3	2.3	1.46	**Y**
ARSENIC	7440-38-2	ug/L	3	3.6	3.6	0.045	**Y**
ARSENIC, DISSOLVED	7440-38-2	ug/L	3	3.7	3.7	0.045	**Y**
BERYLLIUM	7440-41-7	ug/L	3	0.2	0.2	7.3	N
BERYLLIUM, DISSOLVED	7440-41-7	ug/L	3	0.2	0.2	7.3	N
CADMIUM	7440-43-9	ug/L	3	0.3	0.3	1.825	N
CADMIUM, DISSOLVED	7440-43-9	ug/L	3	0.4	0.4	1.825	N
CHROMIUM, DISSOLVED[1]	7440-47-3	ug/L	1	0.6	0.6	10.95	N
COBALT	7440-48-4	ug/L	3	0.9	0.9	--	NS
COBALT, DISSOLVED	7440-48-4	ug/L	3	0.5	0.5	--	NS
COPPER	7440-50-8	ug/L	1	1.2	1.2	146	N
COPPER, DISSOLVED	7440-50-8	ug/L	3	1.5	1.5	146	N
IRON, DISSOLVED	7439-89-6	ug/L	3	8.7	8.7	2,555	N
LEAD[2]	7439-92-1	ug/L	3	1.3	1.3	15	N
LEAD, DISSOLVED[2]	7439-92-1	ug/L	1	1.1	1.1	15	N
MANGANESE, DISSOLVED	7439-96-5	ug/L	3	1.64	1.68	73	N
MERCURY[3]	7439-97-6	ug/L	3	0.1	0.1	--	NS
MERCURY, DISSOLVED[3]	7439-97-6	ug/L	2	0.1	0.1	--	NS
NICKEL	7440-02-0	ug/L	1	1.2	1.2	73	N
SELENIUM, DISSOLVED	7782-49-2	ug/L	1	2.6	2.6	18.25	N
SILVER	7440-22-4	ug/L	3	0.8	0.8	18.25	N
SILVER, DISSOLVED	7440-22-4	ug/L	3	0.7	0.7	18.25	N
THALLIUM	7440-28-0	ug/L	3	3.8	3.8	0.256	**Y**
THALLIUM, DISSOLVED	7440-28-0	ug/L	3	4.4	4.4	0.256	**Y**
VANADIUM	7440-62-2	ug/L	1	0.7	0.7	3.65	N
VANADIUM, DISSOLVED	7440-62-2	ug/L	1	0.4	0.4	3.65	N
ZINC	7440-66-6	ug/L	1	0.6	0.6	1,095	N
Pesticides/PCBs							
4,4'-DDD	72-54-8	ug/L	3	0.0036	0.0036	2.8E-01	N
4,4'-DDE	72-55-9	ug/L	3	0.0036	0.0036	2.0E-01	N
4,4'-DDT	50-29-3	ug/L	3	0.0036	0.0036	2.0E-01	N
ALDRIN	309-00-2	ug/L	3	0.0027	0.0027	3.9E-03	N
ALPHA-BHC	319-84-6	ug/L	3	0.0034	0.0034	1.1E-02	N
ALPHA-CHLORDANE[4]	5103-71-9	ug/L	3	0.0033	0.0033	1.9E-01	N
BETA-BHC	319-85-7	ug/L	3	0.003	0.003	3.7E-02	N
DELTA-BHC[5]	319-86-8	ug/L	3	0.0031	0.0031	1.1E-02	N
DIELDRIN	60-57-1	ug/L	3	0.0032	0.0032	4.2E-03	N
ENDOSULFAN I[6]	959-98-8	ug/L	3	0.0028	0.0028	2.2E+01	N
ENDOSULFAN II[6]	33213-65-9	ug/L	3	0.0031	0.0031	2.2E+01	N
ENDOSULFAN SULFATE[6]	1031-07-8	ug/L	3	0.0041	0.0041	2.2E+01	N
ENDRIN	72-20-8	ug/L	3	0.0029	0.0029	1.1E+00	N
ENDRIN ALDEHYDE[7]	7421-93-4	ug/L	3	0.0037	0.0037	1.1E+00	N
ENDRIN KETONE[7]	53494-70-5	ug/L	3	0.0045	0.0045	1.1E+00	N
GAMMA-BHC (LINDANE)	58-89-9	ug/L	3	0.0026	0.0026	5.2E-02	N
GAMMA-CHLORDANE[4]	5103-74-2	ug/L	3	0.0034	0.0034	1.9E-01	N
HEPTACHLOR	76-44-8	ug/L	3	0.003	0.003	1.5E-02	N
HEPTACHLOR EPOXIDE	1024-57-3	ug/L	3	0.0031	0.0031	7.4E-03	N
METHOXYCHLOR	72-43-5	ug/L	3	0.0036	0.0036	1.8E+01	N
TOXAPHENE	8001-35-2	ug/L	3	0.1	0.1	6.1E-02	**Y**
AROCLOR 1016	12674-11-2	ug/L	3	0.046	0.046	2.6E-01	N
AROCLOR 1221	11104-28-2	ug/L	3	0.053	0.053	3.3E-02	**Y**
AROCLOR 1232	11141-16-5	ug/L	3	0.05	0.05	3.3E-02	**Y**
AROCLOR 1242	53469-21-9	ug/L	3	0.053	0.053	3.3E-02	**Y**
AROCLOR 1248	12672-29-6	ug/L	3	0.024	0.024	3.3E-02	N
AROCLOR 1254[8]	11097-69-1	ug/L	3	0.038	0.038	3.3E-02	**Y**
AROCLOR 1260	11096-82-5	ug/L	3	0.045	0.045	3.3E-02	**Y**
SVOCs							
1,1'-BIPHENYL	92-52-4	ug/L	3	1	1	3.0E+01	N
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	ug/L	3	1	1	2.6E-01	**Y**

Table E.2-2.5
Area B Groundwater Non-Detects Screening
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted T-RBC	Maximum MDL Exceeds SL
2,4,5-TRICHLOROPHENOL	95-95-4	ug/L	3	3	3	3.7E+02	N
2,4,6-TRICHLOROPHENOL	88-06-2	ug/L	3	3	3	3.6E+00	N
2,4-DICHLOROPHENOL	120-83-2	ug/L	3	2	2	1.1E+01	N
2,4-DIMETHYLPHENOL	105-67-9	ug/L	3	1	1	7.3E+01	N
2,4-DINITROPHENOL	51-28-5	ug/L	3	5	5	7.3E+00	N
2,4-DINITROTOLUENE	121-14-2	ug/L	3	1	1	7.3E+00	N
2,6-DINITROTOLUENE	606-20-2	ug/L	3	0.8	0.8	3.7E+00	N
2-CHLORONAPHTHALENE	91-58-7	ug/L	3	1	1	4.9E+01	N
2-CHLOROPHENOL	95-57-8	ug/L	3	2	2	3.0E+00	N
2-METHYLNAPHTHALENE	91-57-6	ug/L	3	2	2	2.4E+00	N
2-METHYLPHENOL	95-48-7	ug/L	3	1	1	1.8E+02	N
2-NITROANILINE	88-74-4	ug/L	3	2	2	--	NS
2-NITROPHENOL	88-75-5	ug/L	3	2	2	--	NS
3,3'-DICHLOROBENZIDINE	91-94-1	ug/L	3	1	1	1.5E-01	**Y**
3-NITROANILINE	99-09-2	ug/L	3	2	2	--	NS
4,6-DINITRO-2-METHYLPHENOL	534-52-1	ug/L	3	1	1	--	NS
4-BROMOPHENYL PHENYL ETHER	101-55-3	ug/L	3	10	10	--	NS
4-CHLORO-3-METHYLPHENOL	59-50-7	ug/L	3	1	1	--	NS
4-CHLOROANILINE	106-47-8	ug/L	3	1	1	1.5E+01	N
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	ug/L	3	10	10	--	NS
4-METHYLPHENOL	106-44-5	ug/L	3	2	2	1.8E+01	N
4-NITROANILINE	100-01-6	ug/L	3	2	2	--	NS
4-NITROPHENOL	100-02-7	ug/L	3	3	3	--	NS
ACENAPHTHENE	83-32-9	ug/L	3	1	1	3.7E+01	N
ACENAPHTHYLENE[9]	208-96-8	ug/L	3	1	1	1.8E+01	N
ACETOPHENONE	98-86-2	ug/L	3	1	1	6.1E+01	N
ANTHRACENE	120-12-7	ug/L	3	1	1	1.8E+02	N
ATRAZINE	1912-24-9	ug/L	3	0.5	0.5	3.0E-01	**Y**
BENZALDEHYDE	100-52-7	ug/L	3	3	3	3.7E+02	N
BIS(2-CHLOROETHOXY)METHANE	111-91-1	ug/L	3	1	1	--	NS
BIS(2-CHLOROETHYL)ETHER	111-44-4	ug/L	3	1	1	9.6E-03	**Y**
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	ug/L	2	1	1	4.8E+00	N
BENZO(A)ANTHRACENE	56-55-3	ug/L	3	0.9	0.9	3.0E-02	**Y**
BENZO(A)PYRENE	50-32-8	ug/L	3	0.9	0.9	3.0E-03	**Y**
BENZO(B)FLUORANTHENE	205-99-2	ug/L	3	2	2	3.0E-02	**Y**
BENZO(G,H,I)PERYLENE[9]	191-24-2	ug/L	3	0.9	0.9	1.8E+01	N
BENZO(K)FLUORANTHENE	207-08-9	ug/L	3	2	2	3.0E-01	**Y**
BUTYL BENZYL PHTHALATE	85-68-7	ug/L	3	10	10	7.3E+02	N
CAPROLACTAM	105-60-2	ug/L	3	1	1	1.8E+03	N
CARBAZOLE	86-74-8	ug/L	3	1	1	3.3E+00	N
CHRYSENE	218-01-9	ug/L	3	1	1	3.0E+00	N
DI-N-BUTYL PHTHALATE	84-74-2	ug/L	3	10	10	3.7E+02	N
DI-N-OCTYL PHTHALATE	117-84-0	ug/L	3	10	10	--	NS
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/L	3	0.8	0.8	3.0E-03	**Y**
DIBENZOFURAN	132-64-9	ug/L	3	1	1	3.7E+00	N
DIETHYL PHTHALATE	84-66-2	ug/L	3	10	10	2.9E+03	N
DIMETHYL PHTHALATE	131-11-3	ug/L	3	10	10	--	NS
FLUORANTHENE	206-44-0	ug/L	3	1	1	1.5E+02	N
FLUORENE	86-73-7	ug/L	3	0.9	0.9	2.4E+01	N
HEXACHLOROBENZENE	118-74-1	ug/L	3	1	1	4.2E-02	**Y**
HEXACHLOROBUTADIENE	87-68-3	ug/L	3	2	2	8.6E-01	**Y**
HEXACHLOROCYCLOPENTADIENE	77-47-4	ug/L	3	1	1	2.2E+01	N
HEXACHLOROETHANE	67-72-1	ug/L	3	1	1	3.7E+00	N
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/L	3	0.8	0.8	3.0E-02	**Y**
ISOPHORONE	78-59-1	ug/L	3	1	1	7.0E+01	N
N-NITROSO-DI-N-PROPYLAMINE	621-64-7	ug/L	3	1	1	9.6E-03	**Y**
N-NITROSODIPHENYLAMINE	86-30-6	ug/L	3	10	10	1.4E+01	N
NAPHTHALENE	91-20-3	ug/L	3	1	1	6.5E-01	**Y**
NITROBENZENE	98-95-3	ug/L	3	2	2	3.5E-01	**Y**
PENTACHLOROPHENOL	87-86-5	ug/L	3	3	3	5.6E-01	**Y**
PHENOL	108-95-2	ug/L	3	0.8	0.8	1.1E+03	N
PHENANTHRENE[9]	85-01-8	ug/L	3	1	1	1.8E+01	N
PYRENE	129-00-0	ug/L	3	1	1	1.8E+01	N
Dioxin/Furans							
OCDD	3268-87-9	ng/L	3	0.1011	0.102	--	NS
OCDF	39001-02-0	ng/L	3	0.1011	0.102	--	NS
1,2,3,4,6,7,8-HpCDD	35822-39-4	ng/L	3	0.0506	0.051	--	NS
1,2,3,4,6,7,8-HpCDF	67562-39-4	ng/L	3	0.0506	0.051	--	NS
1,2,3,4,7,8,9-HpCDF	55673-89-7	ng/L	5	0.00258	0.051	--	NS
1,2,3,4,7,8-HxCDD	39227-28-6	ng/L	6	0.00258	0.051	--	NS

Table E.2-2.5
Area B Groundwater Non-Detects Screening
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Adjusted T-RBC	Maximum MDL Exceeds SL
1,2,3,4,7,8-HxCDF	70648-26-9	ng/L	5	0.00258	0.051	--	NS
1,2,3,6,7,8-HxCDD	57653-85-7	ng/L	5	0.00258	0.051	--	NS
1,2,3,6,7,8-HxCDF	57117-44-9	ng/L	5	0.00258	0.051	--	NS
1,2,3,7,8,9-HxCDD	19408-74-3	ng/L	5	0.00258	0.051	1.1E-02	**Y**
1,2,3,7,8,9-HxCDF	72918-21-9	ng/L	4	0.0026	0.051	--	NS
1,2,3,7,8-PeCDD	40321-76-4	ng/L	4	0.0026	0.051	--	NS
1,2,3,7,8-PeCDF	57117-41-6	ng/L	4	0.0026	0.051	--	NS
2,3,4,6,7,8-HxCDF	60851-34-5	ng/L	4	0.0026	0.051	--	NS
2,3,7,8-TCDD	1746-01-6	ng/L	6	0.000945	0.0102	4.5E-04	**Y**
2,3,7,8-TCDF	51207-31-9	ng/L	5	0.000557	0.0102	--	NS
Total HxCDDs	34465-46-8	ng/L	5	0.00258	0.051	--	NS
Total HxCDFs	55684-94-1	ng/L	4	0.0026	0.051	--	NS
Total PeCDDs	36088-22-9	ng/L	4	0.0026	0.051	--	NS
Total PeCDFs	30402-15-4	ng/L	4	0.0026	0.051	--	NS
Total TCDDs	41903-57-5	ng/L	6	0.000945	0.0102	--	NS
Total TCDFs	55722-27-5	ng/L	6	0.000557	0.0102	--	NS
PAHs							
ACENAPHTHENE	83-32-9	ug/L	3	0.3	0.3	3.7E+01	N
ACENAPHTHYLENE[9]	208-96-8	ug/L	3	0.22	0.22	1.8E+01	N
ANTHRACENE	120-12-7	ug/L	3	0.25	0.25	1.8E+02	N
BENZO(A)ANTHRACENE	56-55-3	ug/L	3	0.047	0.047	3.0E-02	**Y**
BENZO(A)PYRENE	50-32-8	ug/L	3	0.029	0.029	3.0E-03	**Y**
BENZO(B)FLUORANTHENE	205-99-2	ug/L	3	0.04	0.04	3.0E-02	**Y**
BENZO(G,H,I)PERYLENE[9]	191-24-2	ug/L	3	0.18	0.18	1.8E+01	N
BENZO(K)FLUORANTHENE	207-08-9	ug/L	3	0.05	0.05	3.0E-01	N
CHRYSENE	218-01-9	ug/L	3	0.061	0.061	3.0E+00	N
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/L	3	0.082	0.082	3.0E-03	**Y**
FLUORANTHENE	206-44-0	ug/L	3	0.074	0.074	1.5E+02	N
FLUORENE	86-73-7	ug/L	3	0.44	0.44	2.4E+01	N
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/L	3	0.089	0.089	3.0E-02	**Y**
NAPHTHALENE	91-20-3	ug/L	3	0.38	0.38	6.5E-01	N
PHENANTHRENE[9]	85-01-8	ug/L	3	0.21	0.21	1.8E+01	N
PYRENE	129-00-0	ug/L	3	0.12	0.12	1.8E+01	N
Explosives							
1,3,5-TRINITROBENZENE	99-35-4	ug/L	11	0.045	5	1.1E+02	N
1,3-DINITROBENZENE	99-65-0	ug/L	9	0.071	0.23	3.7E-01	N
2,4,6-TRINITROTOLUENE[10]	118-96-7	ug/L	9	0.075	0.1	1.8E+00	N
2,4-DINITROTOLUENE	121-14-2	ug/L	9	0.092	0.12	7.3E+00	N
2,6-DINITROTOLUENE	606-20-2	ug/L	9	0.16	0.27	3.7E+00	N
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	ug/L	9	0.2	0.24	7.3E+00	N
2-NITROTOLUENE	88-72-2	ug/L	9	0.26	0.28	6.1E+00	N
3-NITROTOLUENE	99-08-1	ug/L	9	0.17	0.22	--	NS
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	ug/L	9	0.22	0.31	7.3E+00	N
4-NITROTOLUENE	99-99-0	ug/L	9	0.15	0.49	4.2E+00	N
HMX (OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,	2691-41-0	ug/L	7	0.16	0.2	1.8E+02	N
NITROBENZENE	98-95-3	ug/L	9	0.058	0.15	3.5E-01	N
RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIA	121-82-4	ug/L	8	0.092	0.25	6.1E-01	N
TETRYL (METHYL-2,4,6-TRINITROPHENYLNITRA	479-45-8	ug/L	9	0.15	0.18	1.5E+01	N

Notes:

CAS = Chemical Abstracts Service
µg/L = Microgram Per Liter
ng/L = Nanogram Per Liter
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
T-RBC = Tap Water RBC

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available
[1] = Chromium IV RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Chlordane RBC value was used
[5] = Alpha-BHC RBC value was used
[6] = Endosulfan RBC value was used
[7] = Endrin RBC value was used
[8] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[9] = Pyrene RBC value was used
[10] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

Table E.2-3.1
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Exposure to Contaminants in Area B Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Surface Soil	Aluminum	mg/kg	14,351	15,708	22,600	15,708	mg/kg	95% Student's t UCL	ProUCL 4.0
	Arsenic	mg/kg	1.565	2.076	5.1	2.076	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Chromium	mg/kg	22.34	24.97	41.6	24.97	mg/kg	95% Student's t UCL	ProUCL 4.0
	Cobalt	mg/kg	8.78	9.604	12.2	9.604	mg/kg	95% Student's t UCL	ProUCL 4.0
	Iron	mg/kg	21,018	23,141	35,100	23,141	mg/kg	95% Student's t UCL	ProUCL 4.0
	Lead	mg/kg	356.8	2,581	3,610	2,581	mg/kg	99% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	Manganese	mg/kg	536.2	608.3	883.5	608.3	mg/kg	95% Student's t UCL	ProUCL 4.0
	Vanadium	mg/kg	35.43	39.57	58.9	39.57	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Aroclor 1254	mg/kg	0.621	0.856	2.8	0.856	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Aroclor 1260	mg/kg	0.202	0.358	0.38	0.358	mg/kg	97.5% KM (Chebyshev) UCL	ProUCL 4.0
	Dimethylphthalate	mg/kg	1.55	1.34	1.9	1.34	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Benzo(a)pyrene	mg/kg	0.0299	0.0174	0.057	0.0174	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,4,6-Trinitrotoluene	mg/kg	46.48	20.26	80	20.26	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,4-Dinitrotoluene	mg/kg	5.69	9.533	11	9.533	mg/kg	99% KM (Chebyshev) UCL	ProUCL 4.0
	Dinitrotoluene Mix	mg/kg	5.785	9.628	11.1	9.628	mg/kg	99% KM (Chebyshev) UCL	ProUCL 4.0
	Aminodinitrotoluenes	mg/kg	46	8	23.6	8	mg/kg	95% UCL (Bounding)	FOD < 5%
	RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	mg/kg	0.69	1.51	8.2	1.51	mg/kg	95% UCL (Bounding)	FOD < 5%
	Nitroglycerin	mg/kg	29.6	400	400	400	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	2,3,7,8-TCDD TEQ	mg/kg	2.61E-05	1.92E-04	1.83E-04	1.83E-04	mg/kg	99% Chebyshev (MVUE) UCL	ProUCL 4.0

Notes:
FOD = frequency of detection
For FOD of 100% to 5%, ProUCL 4.0 was used.
For FOD of <5%, bounding was used.
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram

Table E.2-3.2
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Exposure to Contaminants in Area B Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Medium: Total Soil
Exposure Medium: Total Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Total Soil	Aluminum	mg/kg	12,843	13,765	22,600	13,765	mg/kg	95% Student's t UCL	ProUCL 4.0
	Antimony	mg/kg	2.346	2.614	20.7	2.614	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Arsenic	mg/kg	1.395	1.671	5.1	1.671	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Chromium	mg/kg	20.35	22.09	41.6	22.09	mg/kg	95% Student's t UCL	ProUCL 4.0
	Cobalt	mg/kg	7.932	8.468	12.2	8.468	mg/kg	95% Student's t UCL	ProUCL 4.0
	Copper	mg/kg	27.65	44.95	320	44.95	mg/kg	95% H-UCL	ProUCL 4.0
	Iron	mg/kg	19,691	20,993	35,100	20,993	mg/kg	95% Student's t UCL	ProUCL 4.0
	Lead	mg/kg	250.8	1,554	3,610	1,554	mg/kg	99% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	Manganese	mg/kg	423.5	472.7	883.5	472.7	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Vanadium	mg/kg	32.55	34.92	58.9	34.92	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Heptachlor Epoxide	mg/kg	0.1399	0.0629	0.53	0.0629	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Aroclor 1254	mg/kg	0.7345	0.4797	2.80	0.4797	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Aroclor 1260	mg/kg	0.2628	0.1086	0.51	0.1086	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Di-n-octylphthalate	mg/kg	0.444	0.704	0.64	0.64	mg/kg	95% UCL (Bounding)	FOD < 5%
	Dimethylphthalate	mg/kg	1.046	0.308	1.9	0.308	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Benzo(a)pyrene	mg/kg	0.03534	0.0173	0.074	0.0173	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,4,6-Trinitrotoluene	mg/kg	69	61.1	80	61.1	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,4-Dinitrotoluene	mg/kg	57.13	13.78	160	13.78	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Dinitrotoluene Mix	mg/kg	57.22	13.88	160.1	13.88	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Aminodinitrotoluenes	mg/kg	44.8	27.44	66	27.44	mg/kg	95% KM (t) UCL	ProUCL 4.0
	RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	mg/kg	0.41	0.77	8.2	0.77	mg/kg	95% UCL (Bounding)	FOD < 5%
	Nitroglycerin	mg/kg	13.9	32.5	400	32.5	mg/kg	95% UCL (Bounding)	FOD < 5%
	Total Equivalents 2,3,7,8-TCDD	mg/kg	1.12E-05	6.04E-05	1.83E-04	6.04E-05	mg/kg	99% Chebyshev (Mean, Sd) UCL	ProUCL 4.0

Notes:
FOD = frequency of detection
For FOD of 100% to 5%, ProUCL 4.0 was used.
For FOD of <5%, bounding was used.
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram

Table E.2-4.1a
Values used for Daily Intake Equations for Current/Future Scenario - Surface Soil - Exposure Medium Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Maintenance Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
Dermal Absorption *	Maintenance Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) Fraction ingested assumed 100%.

*See Table E.2-4.3 for chemical specific dermal absorption fractions

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

cm^2 = square centimeter

USEPA = U.S. Environmental Protection Agency

EPC = Exposure Point Concentration

Table E.2-4.1b
Values used for Daily Intake Equations for Current/Future Scenario - Surface Soil - Exposure Medium Air
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Maintenance Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = $\frac{CS \times IR \times EF \times ED \times ET \times 1/PEF}{BW \times AT}$
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.5	m^3/hr	USEPA, 1989	
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	(2)	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation.

(2) PEFs provided on Table E.2-4.4

Note that VOCs were not analytes of interest for the site; therefore, the outdoor and indoor vapor inhalation pathways are not quantitatively assessed for the site.

USEPA, 1989. Risk Assessment Guidance for Superfund Volume I - Human Health Evaluation Manual (Part A). Interim Final. EPA/540/1-89/002.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

cm^2 = square centimeter

m^3/hour = cubic meters per hour

USEPA = U.S. Environmental Protection Agency

EPC = Exposure Point Concentration

Table E.2-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Construction Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				FI	Fraction Ingested	1	(unitless)	(1)	
				IRS	Ingestion Rate of Soil	330	mg/day	USEPA, 2002	
	Commercial Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(1)	
				IRS	Ingestion Rate of Soil	50	mg/day	USEPA, 2002	
	Resident	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(1)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
		Child	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(1)	
				IRS	Ingestion Rate of Soil	200	mg/day	USEPA, 1991	

Table E.2-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption*	Construction Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.3	mg/(cm^2-event)	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 2002	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Commercial Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Resident	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.07	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	5,700	cm^2	USEPA, 2004	

Table E.2-4.1c
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption Cont.*	Resident Cont.	Child	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.2	$mg/(cm^2\text{-event})$	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	2,800	cm^2	USEPA, 2004	

Notes:

(1) Fraction ingested assumed 100%.

*See Table E.2-4.3 for chemical specific dermal absorption fractions

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

hr/day = hour per day

cm^2 = square centimeter

USEPA = U.S. Environmental Protection Agency

EPC = Exposure Point Concentration

Table E.2-4.1d
Values used for Daily Intake Equations for Future Scenarios - Total Soil - Exposure Pathway Air
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Total Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Construction Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	2.5	m^3/hr	USEPA, 1991	
				PEF	Particulate Emission Factor	1.20E+06	m^3/kg	(1)	
	Commercial Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	25	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				IR	Inhalation Rate	1.0	m^3/hr	USEPA, 1989	
				PEF	Particulate Emission Factor	6.80E+08	m^3/kg	(1)	
	Resident	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	2	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.63	m^3/hr	(2)	
				PEF	Particulate Emission Factor	6.80E+08	m^3/kg	(1)	
		Child	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	CDI (mg/kg-day) = CS x IR x EF x ED x ET x 1/PEF / BW x AT
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	6	hr/day	USEPA, 1997	
				IR	Inhalation Rate	0.5	m^3/hr	(3)	
				PEF	Particulate Emission Factor	6.80E+08	m^3/kg	(1)	

Notes:

(1) PEFs provided on Table E.2-4.4

(2) The inhalation rate is calculated using a daily long term rate of 15 m^3/day (USEPA, 1991) divided by 24 hours to derive hourly inhalation rate of 0.63 m^3/hour.

(3) The inhalation rate is calculated using a daily long term rate of 12 m^3/day (USEPA, 2003) divided by 24 hours to derive hourly inhalation rate of 0.5 m^3/hour.

Note that VOCs were not analytes of interest for the site; therefore, the outdoor and indoor vapor inhalation pathways are not quantitatively assessed for the site.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 1997. Exposure Factors Handbook. Office of Research and Development. EPA/600/P-95/002Fa through Fc.

kg/mg = Kilogram Per Millogram
mg/kg = Milligram Per Kilogram
hr/day = hour per day
cm^2 = square centimeter
m^3/hour = cubic meters per hour
USEPA = U.S. Environmental Protection Agency
EPC = Exposure Point Concentration

Table E.2-4.2
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Construction Worker	Adult	Groundwater	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	1E-06/0.1	µg/L	EPC	
				ED	Exposure Duration	1	years	USEPA, 1991	
				EF	Exposure Frequency	125	days/year	VDEQ, 2006	
				IRW	Ingestion Rate of Groundwater	0.02	L/day	VDEQ, 2006	
	Commercial Worker	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	1	L/day	USEPA, 1991	
	Resident	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	2	L/day	USEPA, 1991	
		Child	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	CDI (mg/kg-day) = $\frac{CW \times IRW \times EF \times ED \times CF1}{BW \times AT}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				IR-W	Ingestion Rate of Tap Water	1	L/day	USEPA, 1991	

Table E.2-4.2
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption*	Construction Worker	Adult	Groundwater	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$
									where
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	*Organics:*
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	if $t_{event} \le t^*$, DA_{event} = 2 x CF1 x CF2 x FA x Kp x CW x $[(6 \tau_{event} \times t_{event})/\pi]^{1/2}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	1	years	USEPA, 1991	
				EF	Exposure Frequency	125	days/year	VDEQ, 2006	if $t_{event} > t^*$, DA_{event} = CF1 x CF2 x FA x Kp x CW x $[(t_{event}/(1+B))+ 2 \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	(1)	*Inorganics:*
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	DA_{event} = CF1 x CF2 x Kp x CW x t_{event}
				t_{event}	Event Duration	4	hr/event	VDEQ, 2006	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	
	Commercial Worker	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$
									where
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	*Organics:*
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	if $t_{event} \le t^*$, DA_{event} = 2 x CF1 x CF2 x FA x Kp x CW x $[(6 \tau_{event} \times t_{event})/\pi]^{1/2}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	if $t_{event} > t^*$, DA_{event} = CF1 x CF2 x FA x Kp x CW x $[(t_{event}/(1+B))+ 2 \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	800	cm^2	(2)	*Inorganics:*
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	DA_{event} = CF1 x CF2 x Kp x CW x t_{event}
				t_{event}	Event Duration	1	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	

Table E.2-4.2
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption Continued*	Resident	Adult	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$ *where*
				BW	Body Weight	70	kg	USEPA, 1991	*Organics:*
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	if $t_{event} \le t^*$, DA_{event} = 2 x CF1 x CF2 x FA x Kp x CW x $[(6 \times \tau_{event} \times t_{event})/\pi]^{1/2}$
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	24	years	USEPA, 1991	if $t_{event} > t^*$, DA_{event} = CF1 x CF2 x FA x Kp x CW x $[(t_{event}/(1+B))+ 2 \times \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	*Inorganics:*
				SA	Skin Surface Area Available for Contact	18,000	cm^2	USEPA, 2004	DA_{event} = CF1 x CF2 x Kp x CW x t_{event}
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	
				t_{event}	Event Duration	0.58	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	
		Child	Tap Water	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				B	Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	Chemical Specific	dimensionless	USEPA, 2004	Dermal Absorbed Dose (mg/kg-day) = $\frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT}$ *where*
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-03	mg/µg	unit conversion	*Organics:*
				CF2	Conversion Factor 2	1.00E-03	L/cm^3	unit conversion	if $t_{event} \le t^*$, DA_{event} = 2 x CF1 x CF2 x FA x Kp x CW x $[(6 \times \tau_{event} \times t_{event})/\pi]^{1/2}$
				CW	Chemical Concentration in Water	Chemical Specific	µg/L	EPC	
				DA_{event}	Absorbed Dose per Event	Chemical Specific	mg/cm^2-event	USEPA, 2004	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	if $t_{event} > t^*$, DA_{event} = CF1 x CF2 x FA x Kp x CW x $[(t_{event}/(1+B))+ 2 \times \tau_{event}(1+3B+3B^2)/(1+B)^2]$
				EV	Event Frequency	1	events/day	USEPA, 2004	
				FA	Fraction Absorbed Water	Chemical Specific	dimensionless	USEPA, 2004	
				Kp	Skin Permeability Constant	Chemical Specific	cm/hr	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	6,600	cm^2	USEPA, 2004	*Inorganics:*
				t*	Time to Reach Steady State	Chemical Specific	hr	USEPA, 2004	DA_{event} = CF1 x CF2 x Kp x CW x t_{event}
				t_{event}	Event Duration	1	hr/event	USEPA, 2004	
				τ_{event}	Lag Time per Event	Chemical Specific	hr/event	USEPA, 2004	

Table E.2-4.2
Values used for Daily Intake Equations for Future Scenarios - Groundwater - Exposure Pathway Groundwater
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

(1) Best Professional Judgement. Based on the head, hands, and forearms.

(2) Best Professional Judgement. Based on the mean surface area for hands for men and women.

*See Table E.2-4.5 for chemical specific parameters used to calculate absorbed dose per event

Note that VOCs were not analytes of interest for the site; therefore, the outdoor and indoor vapor inhalation pathways are not quantitatively assessed for the site.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final.

VDEQ, 2006. Voluntary Remediation Program Risk Assessment Guidance. www.deq.virginia.gov/vrprisk/raguide.html.

kg = Kilogram

ug/L = Microgram Per Liter

mg/kg = milligram per kilogram

cm^2 = square centimeter

cm^3 = Cubic Centimeter

L/day = liter/day

USEPA = U.S. Environmental Protection Agency

VDEQ = Virginia Department of Environmental Quality

EPC = Exposure Point Concentration

Table E.2-4.3.RME
Dermal Absorption Fractions and Volatilization Factors for Soil/Sediment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	ABSd * (m^3/kg)	D_i (cm^2/s)	D_w (cm^2/s)	K_{oc} (cm^3/g)	K_d (cm^3/g)	H (unitless)	Da (cm^2/sec)	$VF_{C/I\ Worker}$/ $VF_{Maint.\ Worker}$ (m^3/kg)	$VF_{Const.\ Worker}$ (m^3/kg)	$VF_{Adult\ Resident}$ (m^3/kg)	$VF_{Child\ Resident}$ (m^3/kg)
Aluminum	7429-90-5	1.00E-02	--	--	--	--	--	--	--	--	--	--
Antimony	7440-36-0	1.00E-02	--	--	--	--	--	--	--	--	--	--
Arsenic	7440-38-2	3.00E-02	--	--	--	--	--	--	--	--	--	--
Chromium	7440-47-3	1.00E-02	--	--	--	--	--	--	--	--	--	--
Cobalt	7440-48-4	1.00E-02	--	--	--	--	--	--	--	--	--	--
Copper	7440-50-8	1.00E-02	--	--	--	--	--	--	--	--	--	--
Iron	7439-89-6	1.00E-02	--	--	--	--	--	--	--	--	--	--
Manganese	7439-96-5	1.00E-02	--	--	--	--	--	--	--	--	--	--
Thallium	7440-28-0	1.00E-02	--	--	--	--	--	--	--	--	--	--
Vanadium	7440-62-2	1.00E-02	--	--	--	--	--	--	--	--	--	--
Heptachlor epoxide	1024-57-3	1.00E-01	--	--	--	--	--	--	--	--	--	--
Aroclor 1254	11097-69-1	1.40E-01	--	--	--	--	--	--	--	--	--	--
Aroclor 1260	11096-82-5	1.40E-01	--	--	--	--	--	--	--	--	--	--
Dimethylphthalate	131-11-3	1.00E-01	--	--	--	--	--	--	--	--	--	--
Di-n-octylphthalate	117-84-0	1.00E-01	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	1.30E-01	--	--	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene[1]	118-96-7	3.00E-02	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	121-14-2	1.00E-01	--	--	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	606-20-2	1.00E-01	--	--	--	--	--	--	--	--	--	--
Dinitrotoluene Mix[2]	--	1.00E-01	--	--	--	--	--	--	--	--	--	--
Aminodinitrotoluenes[1,3]	-	6.00E-03	--	--	--	--	--	--	--	--	--	--
RDX	121-82-4	1.50E-02	--	--	--	--	--	--	--	--	--	--
Nitroglycerin[1]	55-63-0	1.00E-02	--	--	--	--	--	--	--	--	--	--
2,3,7,8-TCDD Equivalents	1746-01-6	3.00E-02	--	--	--	--	--	--	--	--	--	--

Notes:

CAS = Chemical Abstract Service

ABS_d = Dermal Absorption Fraction

VF = Volatilization Factor

D_a = Apparent Diffusivity

m^3/kg = cubic meters per kilogram

cm2/s = centimeter squared per second

*ABS_d values are taken from Exhibit 3-4, Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation and Manual, Part E; Supplemental Guidance for Dermal Risk Assessment, July 2004, and Region III Technical Guidance, Assessing Dermal Exposure in Soil, December 1995.

[1] = ABS_d value for 2,4,6-Trinitrotoluene, RDX, Nitroglycerin, and Aminodinitrotoluenes from RAIS

[2]= ABS_d value for 2,4-Dintrotoluene used for Dinitrotoluene Mix

[3]= ABS_d value for 2-Amino-4,6-Dintrotoluene used for Aminodinitrotoluenes

D_a values calculated using the following equation and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002. Equation 4-8 from USEPA, 2002:

$$D_a = [(\Theta_a^{10/3} \times Di \times H) + (\Theta_w^{10/3} \times D_w))/n^2]/[((\rho_b \times K_d) + \Theta_w + (\Theta_a \times H)]$$

Θ_a (L_{air}/L_{soil}) =	0.28
Θ_w (L_{water}/L_{soil}) =	0.15
D_i(cm2/sec) =	varies
D_w(cm2/sec) =	varies
H(unitless) =	varies
n (L_{Pore}/L_{soil}) =	0.43
ρ_b (g/cm^3) =	1.50
K_d (cm^3/g) =	varies
K_{oc} (cm^3/g) =	varies
foc (g/g) =	0.006

Table E.2-4.3.RME
Dermal Absorption Fractions and Volatilization Factors for Soil/Sediment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes continued:

VF (soil only) values for commercial/industrial worker, adult resident, and child resident, and adolescent tresspasser calculated using the following equations and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

Equation 4-8 from USEPA, 2002:

$VF = Q/C_{vol} * (3.14 * D_A * T)^{1/2} * CF/(2 * \rho_b * D_a)$

Q/C_{vol} (g/m2-s)/kg/m3) =	46.22	calculated value
D_A (cm^2/sec) =	varies	chemical specific (see above)
T (sec) =	varies	receptor specific exposure interval (T= ED(yrs)*365 days/year*24 hours/day*60 min/hour*60sec/min)
		(Maintenance Worker=7.88E+08 sec, Commercial/Industrial Worker=7.88E+08 sec, Adult Resident=7.56E+08, Child Resident=1.89E+08, and Adolescent Trespasser=3.15E+08 sec)
CF (m^2/cm^2) =	1.00E-04	default
ρ_b (g/cm^3)	1.5	default

Exhibit D-3 from USEPA, 2002:

$Q/C_{vol} = A * e^{((\ln A_{site} - B)^2/C)}$ = 46.22

A =	9.9253	Huntington value
B =	18.6636	Huntington value
C =	211.8862	Huntington value
A_{site} (acres)=	1.84	contaminated site area

VF (soil only) values for construction worker were calculated using the following equations and values from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

Equation 5-14 from USEPA 2002:

$VF = Q/C_{sa} * 1/F_D * (3.14 * D_A * T)^{1/2} * CF/(2 * \rho_b * D_A)$

Q/C_{sa} (g/m^2-s)/kg/m^3) =	11.23	calculated value
F_D (unitless) =	0.185	default
D_A (cm^2/sec) =	varies	chemical specific (see above)
T (sec) =	3.15E+07	receptor specific exposure interval (T= ED(yrs)*365 days/year*24 hours/day*60 min/hour*60sec/min)
CF (m^2/cm^2) =	1.00E-04	default
ρ_b (kg/L) =	1.5	default

Equation 5-15 from USEPA, 2002:

$Q/C_{sa} = A * e^{((\ln A_c - B)^2/C)}$ = 11.23

A=	2.4538	default
B =	17.566	default
C =	189.0426	default
A_c (acres)=	1.84	contaminated site area

Table E.2-4.4.RME
PEF Calculations - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Commercial Worker/Resident

Equation 4-5 from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$PEF = Q / C_{wind} \cdot \frac{3{,}600 s/h}{0.036 \cdot (1-V) \cdot (U_m / U_t)^3 \cdot F(x)}$$

Parameter	Value	
PEF	6.70E+08	
Q/C_{wind}	46.22	calculated below
V	0.5	default
U_m	4.69	default
U_t	11.32	default
F(x)	0.194	default

PEF = particulate emission factor (m^3/kg)
s/h = seconds per hour
Q/Cwind = Inverse of the ratio of the geometric mean air concentration to the emission flux at the center of a square source (g/m^3-s per kg/m^3)
V = fraction of vegatative cover (unitless)
U_m = mean annual windspeed (m/s)
U_t = equivalent threshold value of windspeed at 7m (m/s)
F(x) = function dependent on Um/Ut derived using Cowherd et al. (1985)
Site Area = 1.84

Q/C_{wind} calculated in accordance with Exhibit D-2 from USEPA, 2002
using A, B, and C values for Huntington, WV:
$Q/C_{wind} = A*e^{((\ln A_{site} - B)^2/C)}$

Q/C_{wind}=	46.22	
A =	9.9253	unitless
B =	18.6636	unitless
C =	211.8862	unitless
A_{site}=	1.84	acres

Table E.2-4.4.RME
PEF Calculations - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Construction Worker

Equation 5-5 from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$PEF_{sc} = Q / C_{sr} \cdot \frac{1}{F_D} \cdot \left[\frac{T \cdot A_R}{556 \cdot (W/3)^{\wedge} 0.4 \cdot \frac{(365\ d/yr - p)}{365\ d/yr} \cdot \sum VKT} \right]$$

Parameter	Value	
PEF_{sc}	1.18E+06	
Q/C_{sr}	18.66	calculated
F_D	0.185	default
T (sec)	7,488,000	assumed-see below
A_R (m^2)	526	calculated
W (tons)	8	assumed-see below
p (days/yr)	140	determined-see below
sumVKT (km)	663	assumed-see below

PEF_{sr} = subchronic road particulate emission factor (m^3/kg)
Q/C_{sr} = Inverse of the ratio of the 1-h geometric mean air concentration to the emission flux along a straight road segment bisecting a square site (g/m2-s per kg/m3)
F_D = dispersion correction factor (unitless)
T = total time over which construction occurs-total time period assumed to be 6 months (52wks x 5days per week x 8 hours per day x 3,600 s per hour)
A_R = surface area of contaminated road segment (m^2)
L_R = length of road segment (assumed to equal to (1.84 acres*43,560 ft^2/acre)$^{1/2}$)
W_R = width of road segment (assumed to be 20 ft)
$A_R = L_R \times W_R \times 0.092903 m^2/ft^2$
A_R= 526 m^2
W = mean vehicle weight assumed to be 8 tons ([(20 cars * 2 tons/car)+(10 trucks*20 tons/truck)]/30 vehicles)
p = number of days with at least 0.01 inches of precipitation (from Exhibit 5-2 140 days/year)
sumVKT = sum of fleet vehicle kilometers traveled during the exposure duration (km)
(30 of vehicles x 0.085 of km/day x 52wks x 5 days/wk)

Q/C_{sr} calculated in accordance with Equation 5-6:
using A, B, and C default values:
$Q/C_{sr} = A*e^{\wedge}((\ln A_s - B)^2/C))$

Q/C_{sr}=	18.66	g/m^2-s per kg/m^3
A =	12.9351	unitless
B =	5.7383	unitless
C =	71.7711	unitless
A_s =	1.84	acres

Table E.2-4.5.RME
Parameter Values Used for Groundwater - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	FA	Kp (cm/hr)	tau $_{event}$ (hr)	B	t* (hr)
Aluminum	7429-90-5	--	1.0E-03	--	--	--
Cobalt	7440-36-0	--	1.0E-03	--	--	--
Manganese	7439-96-5	--	1.0E-03	--	--	--
Total 2,3,7,8-TCDD Equivalents	1746-01-6	0.5	8.1E-01	6.8E+00	5.6E+00	3.0E+01

Notes:

Organic parameter values are taken from Organic values from Organic Chemicals in Water Spreadsheet (http://www.epa.gov/oswer/riskassessment/ragse/index.htm).

Inorganic parameters were taken from Exhibit 3-1, Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation Manual, Part E; Supplemental Guidance for Dermal Risk Assessment. July 2004.

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Table E.2-5.1
Non-Cancer Toxicity Data - Oral/Dermal - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s)
Aluminum	7429-90-5	Chronic	1.00E+00	mg/kg-day	1	1.00E+00	mg/kg-day	developmental CNS	100	PPRTV	07/26/2001
Antimony	7440-36-0	Chronic	4.00E-04	mg/kg-day	0.15	6.00E-05	mg/kg-day	blood	1000	IRIS	04/02/2007
Antimony	7440-36-0	Subchronic	2.00E-04	mg/kg-day	0.15	3.00E-05	mg/kg-day	blood	300	PPRTV	07/26/1999
Arsenic	7440-38-2	Chronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	skin/ vascular	3	IRIS	04/02/2007
Arsenic	7440-38-2	Subchronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	skin	3	HEAST	07/31/1997
Chromium(2)	7440-47-3	Chronic	3.00E-03	mg/kg-day	0.025	7.50E-05	mg/kg-day	NOAEL	900	IRIS	04/02/2007
Chromium(2)	7440-47-3	Subchronic	2.00E-02	mg/kg-day	0.025	5.00E-04	mg/kg-day	NOAEL	100	HEAST	07/31/1997
Cobalt	7440-48-4	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	blood	10	PPRTV	01/15/2002
Copper	7440-50-8	Chronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	GI tract	NA	HEAST	07/31/1997
Copper	7440-50-8	Subchronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	GI tract	NA	HEAST	07/31/1997
Iron	7439-89-6	Chronic	7.00E-01	mg/kg-day	1	7.00E-01	mg/kg-day	blood/ liver/ GI tract	1	PPRTV, Region III	10/11/2007
Manganese (non-food)	7439-96-5	Chronic	2.00E-02	mg/kg-day	0.04	8.00E-04	mg/kg-day	CNS	1	IRIS	04/02/2007
Thallium	7440-28-0	Chronic	7.00E-05	mg/kg-day	1	7.00E-05	mg/kg-day	liver/ blood/ hair	3000	Other, Region III	10/31/2006
Vanadium	7440-62-2	Chronic	1.00E-03	mg/kg-day	0.026	2.60E-05	mg/kg-day	kidney	NA	NCEA, Region III	10/25/2005
Vanadium	7440-62-2	Subchronic	7.00E-03	mg/kg-day	0.026	1.80E-04	mg/kg-day	kidney/ blood	100	HEAST	07/31/1997
Heptachlor Epoxide	1024-57-3	Chronic	1.30E-05	mg/kg-day	1	1.30E-05	mg/kg-day	liver	1000	IRIS	04/02/2007
Heptachlor Epoxide	1024-57-3	Subchronic	1.30E-05	mg/kg-day	1	1.30E-05	mg/kg-day	liver	1000	HEAST	07/31/1997
Aroclor 1254	11097-69-1	Chronic	2.00E-05	mg/kg-day	1	2.00E-05	mg/kg-day	eyes	300	IRIS	04/02/2007
Aroclor 1254	11097-69-1	Subchronic	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	immune system	100	HEAST	07/31/1997
Aroclor 1260	11096-82-5	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Dimethylphthalate	131-11-3	Chronic	1.00E+01	mg/kg-day	1	1.00E+01	mg/kg-day	NA	NA	VDEQ	06/19/2006
Di-n-octylphthalate	117-84-0	Chronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	liver/thyroid	1000	PPRTV	09/11/2002
Benzo(a)pyrene	50-32-8	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	118-96-7	Chronic	5.00E-04	mg/kg-day	1	5.00E-04	mg/kg-day	liver	1000	IRIS	04/02/2007
2,4-Dinitrotoluene	121-14-2	Chronic	2.00E-03	mg/kg-day	1	2.00E-03	mg/kg-day	CNS/ blood/ liver	100	IRIS	04/02/2007
2,4-Dinitrotoluene	121-14-2	Subchronic	2.00E-03	mg/kg-day	1	2.00E-03	mg/kg-day	CNS/ blood/ liver	100	HEAST	07/31/1997
2,6-Dinitrotoluene	606-20-2	Chronic	1.00E-03	mg/kg-day	1	1.00E-03	mg/kg-day	CNS/ blood/ liver	3000	HEAST	07/31/1997
2,6-Dinitrotoluene	606-20-2	Subchronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	CNS/ blood/ liver	300	HEAST	07/31/1997
Dinitrotoluene Mix(3)	--	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Aminodinitrotoluenes(4)	-	Chronic	2.00E-03	mg/kg-day	1	2.00E-03	mg/kg-day	NA	NA	Region III	04/10/2007
RDX	121-82-4	Chronic	3.00E-03	mg/kg-day	1	3.00E-03	mg/kg-day	prostate	100	IRIS	04/02/2007
RDX	121-82-4	Subchronic	3.00E-03	mg/kg-day	1	3.00E-03	mg/kg-day	prostate	100	HEAST	7/37/1997
Nitroglycerin	55-63-0	Chronic	1.00E-04	mg/kg-day	1	1.00E-04	mg/kg-day	vascular	NA	PPRTV, Region III	04/10/2007
2,3,7,8-TCDD Eqivalents	1746-01-6	NA	NA	NA	1	NA	NA	NA	NA	NA	NA

Notes:

CAS = Chemical Abstract Service
RfD = Reference Dose
mg/(kg-d) = milligrams per kilogram day
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
VDEQ = Virginia Department of Environmental Quality
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III, VDEQ, and HEAST.
For IRIS values, the date of the IRIS search is provided.
For HEAST values, the date of HEAST is provided.
For PPRTV/NCEA, date of paper is provided.
For NCEA, VDEQ values, the date of the VDEQ Voluntary Remediation Program Table update is provided.
For VDEQ values, the date of the VDEQ Voluntary Remediation Program Table update is provided.
For Region III values, the date of the RBC Table is provided.

(1) Oral absorption efficiency for dermal from Risk Assessment Guidance for Superfund (RAGS), Volume I:
Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005. 2004.
(2) Chromium VI toxicity value used
(3) Noncarcinogenic hazard for 2,4-Dinitrotoluene and 2,6-Dinitrotoluene evaluated independantly for each compound
(4) Noncarcinogenic hazard for 2-Amino-4,6-Dinitrotoluene and 4-Amino-2,6-Dinitrotoluene evaluated as Aminodinitrotoluenes

Table E.2-5.2
Non-Cancer Toxicity Data - Inhalation - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
			Value	Units	Value	Units			Source(s)	Date(s)
Aluminum	7429-90-5	Chronic	5.00E-03	mg/m3	1.00E-03	mg/kg-day	CNS	300	PPRTV	07/26/2001
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	Subchronic	4.00E-04	mg/m3	1.10E-04	mg/kg-day	lungs	100	PPRTV	07/26/1999
Arsenic	7440-38-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium(1)	7440-47-3	Chronic	1.00E-04	mg/m3	3.00E-05	mg/kg-day	respiratory	300	IRIS	04/02/2007
Cobalt	7440-48-4	Chronic	2.00E-05	mg/m3	5.70E-06	mg/kg-day	respiratory	100	PPRTV	01/15/2002
Copper	7440-50-8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	7439-89-6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (non-food)	7439-96-5	Chronic	5.00E-05	mg/m3	1.40E-05	mg/kg-day	CNS	1000	IRIS	04/02/2007
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	1024-57-3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethylphthalate	131-11-3	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylophthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	118-96-7	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	121-14-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	606-20-2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix(2)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aminodinitrotoluenes(3)	-	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	121-82-4	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	55-63-0	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD Eqivalents	1746-01-6	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

RfC = Reference Concentration
RfD = Reference Dose
mg/m^3 = milligrams per cubic meter
mg/(kg-d) = milligrams per kilogram day
IRIS = Integrated Risk Information System
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III, VDEQ, and HEAST.
For IRIS values, the date of the IRIS search is provided.
For PPRTV, date of paper is provided.

(1) Toxicity data for chromium VI particulates
(2) Noncarcinogenic hazard for 2,4-Dinitrotoluene and 2,6-Dinitrotoluene evaluated independantly for each compound
(3) Noncarcinogenic hazard for 2-Amino-4,6-Dinitrotoluene and 4-Amino-2,6-Dinitrotoluene evaluated as Aminodinitrotoluenes

Table E.2-6.1.RME
Cancer Toxicity Data - Oral/Dermal - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
		Value	Units		Value	Units		Source(s)	Date(s)
Aluminum	7429-90-5	NA	NA	1	NA	NA	NA	NA	NA
Antimony	7440-36-0	NA	NA	0.15	NA	NA	NA	NA	NA
Arsenic	7440-38-2	1.50E+00	1/(mg/kg-day)	1	1.50E+00	1/(mg/kg-day)	A	IRIS	04/02/2007
Chromium[(2)]	7440-47-3	NA	NA	0.025	NA	NA	Cannot Be Determined	IRIS	04/02/2007
Cobalt	7440-48-4	NA	NA	1	NA	NA	NA	NA	NA
Copper	7440-50-8	NA	NA	1	NA	NA	D	IRIS	04/02/2007
Iron	7439-89-6	NA	NA	1	NA	NA	NA	NA	NA
Manganese (non-food)	7439-96-5	NA	NA	0.04	NA	NA	D	IRIS	04/02/2007
Thallium	7440-28-0	NA	NA	1	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	0.026	NA	NA	NA	NA	NA
Heptachlor Epoxide	1024-57-3	9.10E+00	1/(mg/kg-day)	1	9.10E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
Aroclor 1254	11097-69-1	2.00E+00	1/(mg/kg-day)	1	2.00E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
Aroclor 1260	11096-82-5	2.00E+00	1/(mg/kg-day)	1	2.00E+00	1/(mg/kg-day)	B2	Region III	04/10/2007
Dimethylphthalate	131-11-3	NA	NA	1	NA	NA	D	IRIS	04/02/2007
Di-n-octylphthalate	117-84-0	NA	NA	1	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	7.30E+00	1/(mg/kg-day)	1	7.30E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
2,4,6-Trinitrotoluene	118-96-7	3.00E-02	1/(mg/kg-day)	1	3.00E-02	1/(mg/kg-day)	C	IRIS	04/02/2007
2,4-Dinitrotoluene[(3)]	121-14-2	NA	NA	1	NA	NA	NA	NA	NA
2,6-Dinitrotoluene[(3)]	606-20-2	NA	NA	1	NA	NA	NA	NA	NA
Dinitrotoluene Mix	--	6.80E-01	1/(mg/kg-day)	1	6.80E-01	1/(mg/kg-day)	B2	IRIS	04/02/2007
Aminodinitrotoluenes[(4)]	-	NA	NA	1	NA	NA	NA	NA	NA
RDX	121-82-4	1.10E-01	1/(mg/kg-day)	1	3.00E-02	1/(mg/kg-day)	C	IRIS	04/02/2007
Nitroglycerin	55-63-0	1.70E-02	1/(mg/kg-day)	1	1.70E-02	1/(mg/kg-day)	C	PPRTV, Region III	04/10/2007
2,3,7,8-TCDD Eqivalents	1746-01-6	1.50E+05	1/(mg/kg-day)	1	1.50E+05	1/(mg/kg-day)	B2	HEAST	07/31/1997

Table E.2-6.1.RME
Cancer Toxicity Data - Oral/Dermal - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

CSF = Cancer Slope Factor
mg/(kg-d) = Milligrams Per Kilogram Day
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III and VDEQ.
For IRIS values, the date of the IRIS search is provided.
For HEAST values, the date of the HEAST Table is provided.
For Region III values, the date of the RBC Table is provided.

Cancer Guideline Description:
A = Human carcinogen
B1 = Probable human carcinogen - indicates that limited human data are available.
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C = Possible human carcinogen
D = Not classifiable as a human carcinogen

(1) Oral absorption efficiency for dermal from Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. . EPA/540/R/99/005. 2004
(2) Chromium VI toxicity data used.
(3) Carcinogenic risk for 2,4-Dinotrotoluene and 2,6-Dinitrotoluene evaluated as Dinitrotoluene Mix
(4) Carcinogenic risk for 2-Amino-4,6-Dinitrotoluene and 4-Amino-2,6-Dinitrotoluene evaluated as Aminodinitrotoluenes

Table E.2-6.2.RME
Cancer Toxicity Data - Inhalation - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description	CSF	
		Value	Units	Value	Units		Source(s)	Date(s)
Aluminum	7429-90-5	NA	NA	NA	NA	NA	NA	NA
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA
Arsenic	7440-38-2	4.30E+00	1/(mg/m3)	1.50E+01	1/(mg/kg-day)	A	IRIS	04/02/2007
Chromium[1]	7440-47-3	1.20E+01	1/(mg/m3)	4.20E+01	1/(mg/kg-day)	A	IRIS	04/02/2007
Cobalt	7440-48-4	2.80E+00	1/(mg/m3)	9.80E+00	1/(mg/kg-day)	B2	PPRTV	01/15/2002
Copper	7440-50-8	NA	NA	NA	NA	D	IRIS	04/02/2007
Iron	7439-89-6	NA	NA	NA	NA	NA	NA	NA
Manganese (non-food)	7439-96-5	NA	NA	NA	NA	D	IRIS	04/02/2007
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	NA	NA	NA
Heptachlor Epoxide	1024-57-3	2.60E+00	1/(mg/m3)	9.10E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
Aroclor 1254	11097-69-1	5.71E-01	1/(mg/m3)	2.00E+00	1/(mg/kg-day)	B2	IRIS	04/02/2007
Aroclor 1260	11096-82-5	5.71E-01	1/(mg/m3)	2.00E+00	1/(mg/kg-day)	B2	Region III	04/10/2007
Dimethylphthalate	131-11-3	NA	NA	NA	NA	D	IRIS	NA
Di-n-octylphthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	8.86E-01	1/(mg/m3)	3.10E+00	1/(mg/kg-day)	B2	NCEA, Region III	04/10/2007
2,4,6-Trinitrotoluene	118-96-7	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	121-14-2	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	606-20-2	NA	NA	NA	NA	NA	NA	NA
Dinitrotoluene Mix [2]	--	NA	NA	NA	NA	NA	NA	NA
Aminodinitrotoluenes[3]	-	NA	NA	NA	NA	NA	NA	NA
RDX	121-82-4	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	55-63-0	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD Eqivalents	1746-01-6	4.29E+04	1/(mg/m3)	1.50E+05	1/(mg/kg-day)	B2	HEAST	07/31/1997

Table E.2-6.2.RME
Cancer Toxicity Data - Inhalation - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

CSF = Cancer Slope Factor
mg/(kg-d) = Milligrams Per Kilogram Day
USEPA = U.S. Environmental Protection Agency
Region III = U.S. Environmental Protection Agency, Region III
NCEA = National Center for Environmental Assessment
IRIS = Integrated Risk Information System
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), Region III and VDEQ.
For IRIS values, the date of the IRIS search is provided.
For Region III values, the date of the Region III RBC Table is provided.
For PPRTV, date of paper is provided.

Cancer Guideline Description:
A = Human carcinogen
B1 = Probable human carcinogen - indicates that limited human data are available.
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C = Possible human carcinogen
D = Not classifiable as a human carcinogen

(1) = Chromium VI toxicity data used
(2) Carcinogenic risk for 2,4-Dinotrotoluene and 2,6-Dinitrotoluene evaluated as Dinitrotoluene Mix
(3) Carcinogenic risk for 2-Amino-4,6-Dinitrotoluene and 4-Amino-2,6-Dinitrotoluene evaluated as Aminodinitrotoluenes

TABLE E.2-7.1.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Populatior:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Soil	Soil	Ingestion	Aluminum	15708	mg/kg	1.10E-03	mg/kg-day	--	--	--	3.07E-03	mg/kg-day	1.00E+00	mg/kg-day	3.E-03
				Arsenic	2.08	mg/kg	1.45E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	2.E-07	4.07E-07	mg/kg-day	3.00E-04	mg/kg-day	1.E-03
				Chromium	24.97	mg/kg	1.75E-06	mg/kg-day	--	--	--	4.89E-06	mg/kg-day	3.00E-03	mg/kg-day	2.E-03
				Cobalt	9.6	mg/kg	6.71E-07	mg/kg-day	--	--	--	1.88E-06	mg/kg-day	2.00E-02	mg/kg-day	9.E-05
				Iron	23141	mg/kg	1.62E-03	mg/kg-day	--	--	--	4.53E-03	mg/kg-day	7.00E-01	mg/kg-day	6.E-03
				Manganese	608	mg/kg	4.25E-05	mg/kg-day	--	--	--	1.19E-04	mg/kg-day	2.00E-02	mg/kg-day	6.E-03
				Vanadium	39.6	mg/kg	2.77E-06	mg/kg-day	--	--	--	7.75E-06	mg/kg-day	1.00E-03	mg/kg-day	8.E-03
				Aroclor 1254	0.856	mg/kg	5.98E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-07	1.68E-07	mg/kg-day	2.00E-05	mg/kg-day	8.E-03
				Aroclor 1260	0.358	mg/kg	2.50E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-08	7.01E-08	mg/kg-day	--	--	--
				Dimethylphthalate	1.34	mg/kg	9.37E-08	mg/kg-day	--	--	--	2.62E-07	mg/kg-day	1.00E+01	mg/kg-day	3.E-08
				Benzo(a)pyrene	0.0174	mg/kg	1.22E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	9.E-09	3.41E-09	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	20.26	mg/kg	1.42E-06	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	4.E-08	3.96E-06	mg/kg-day	5.00E-04	mg/kg-day	8.E-03
				2,4-Dinitrotoluene	9.533	mg/kg	6.66E-07	mg/kg-day	--	--	--	1.87E-06	mg/kg-day	2.00E-03	mg/kg-day	9.E-04
				Dinitrotoluene Mix	9.628	mg/kg	6.73E-07	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	5.E-07	1.88E-06	mg/kg-day	--	--	--
				Aminodinitrotoluenes	8	mg/kg	5.59E-07	mg/kg-day	--	--	--	1.57E-06	mg/kg-day	2.00E-03	mg/kg-day	8.E-04
				RDX	1.51	mg/kg	1.06E-07	mg/kg-day	1.10E-01	mg/kg-day $^{-1}$	1.E-08	2.95E-07	mg/kg-day	3.00E-03	mg/kg-day	1.E-04
				Nitroglycerin	400	mg/kg	2.80E-05	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	5.E-07	7.83E-05	mg/kg-day	1.00E-04	mg/kg-day	8.E-01
				2,3,7,8-TCDD Equivalents	1.83E-04	mg/kg	1.28E-11	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.9.E-06	3.58E-11	mg/kg-day	--	--	--
			Exp. Route Total								3.3.E-06					8.E-01
			Dermal Absorption	Aluminum	15708	mg/kg	3.62E-05	mg/kg-day	--	--	--	1.01E-04	mg/kg-day	1.00E+00	mg/kg-day	1.E-04
				Arsenic	2.08	mg/kg	1.44E-08	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	2.E-08	4.03E-08	mg/kg-day	3.00E-04	mg/kg-day	1.E-04
				Chromium	24.97	mg/kg	5.76E-08	mg/kg-day	--	--	--	1.61E-07	mg/kg-day	7.50E-05	mg/kg-day	2.E-03
				Cobalt	9.6	mg/kg	2.21E-08	mg/kg-day	--	--	--	6.20E-08	mg/kg-day	2.00E-02	mg/kg-day	3.E-06
				Iron	23141	mg/kg	5.34E-05	mg/kg-day	--	--	--	1.49E-04	mg/kg-day	7.00E-01	mg/kg-day	2.E-04
				Manganese	608	mg/kg	1.40E-06	mg/kg-day	--	--	--	3.93E-06	mg/kg-day	8.00E-04	mg/kg-day	5.E-03
				Vanadium	39.6	mg/kg	9.13E-08	mg/kg-day	--	--	--	2.56E-07	mg/kg-day	2.60E-05	mg/kg-day	1.E-02
				Aroclor 1254	0.856	mg/kg	2.76E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	6.E-08	7.74E-08	mg/kg-day	2.00E-05	mg/kg-day	4.E-03
				Aroclor 1260	0.358	mg/kg	1.16E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-08	3.24E-08	mg/kg-day	--	--	--
				Dimethylphthalate	1.34	mg/kg	3.09E-08	mg/kg-day	--	--	--	8.65E-08	mg/kg-day	1.00E+01	mg/kg-day	9.E-09
				Benzo(a)pyrene	0.0174	mg/kg	5.22E-10	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	4.E-09	1.46E-09	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	20.26	mg/kg	1.40E-07	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	4.E-09	3.93E-07	mg/kg-day	5.00E-04	mg/kg-day	8.E-04
				2,4-Dinitrotoluene	9.533	mg/kg	2.20E-07	mg/kg-day	--	--	--	6.16E-07	mg/kg-day	2.00E-03	mg/kg-day	3.E-04
				Dinitrotoluene Mix	9.628	mg/kg	2.22E-07	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	2.E-07	6.22E-07	mg/kg-day	--	--	--
				Aminodinitrotoluenes	8	mg/kg	1.11E-08	mg/kg-day	--	--	--	3.10E-08	mg/kg-day	2.00E-03	mg/kg-day	2.E-05
				RDX	1.51	mg/kg	5.22E-09	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	2.E-10	1.46E-08	mg/kg-day	3.00E-03	mg/kg-day	5.E-06
				Nitroglycerin	400	mg/kg	9.23E-07	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	2.E-08	2.58E-06	mg/kg-day	1.00E-04	mg/kg-day	3.E-02
				2,3,7,8-TCDD Equivalents	1.83E-04	mg/kg	1.27E-12	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-07	3.55E-12	mg/kg-day	--	--	--
			Exp. Route Total								5.E-07					5.E-02
		Exposure Point Total									4.E-06					9.E-01
	Exposure Medium Total										4.E-06					9.E-01

TABLE E.2-7.1.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Populatior:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
	Air	Fugitive Dust	Inhalation	Aluminum	15708	mg/kg	9.98E-08	mg/kg-day	--	--	--	2.79E-07	mg/kg-day	1.00E-03	mg/kg-day	3.E-04
				Arsenic	2.08	mg/kg	1.32E-11	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	2.E-10	3.70E-11	mg/kg-day	--	--	--
				Chromium	24.97	mg/kg	1.59E-10	mg/kg-day	4.20E+01	mg/kg-day $^{-1}$	7.E-09	4.44E-10	mg/kg-day	3.00E-05	mg/kg-day	1.E-05
				Cobalt	9.6	mg/kg	6.10E-11	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	6.E-10	1.71E-10	mg/kg-day	5.70E-06	mg/kg-day	3.E-05
				Iron	23141	mg/kg	1.47E-07	mg/kg-day	--	--	--	4.12E-07	mg/kg-day	--	--	--
				Manganese	608	mg/kg	3.86E-09	mg/kg-day	--	--	--	1.08E-08	mg/kg-day	1.40E-05	mg/kg-day	7.7.E-04
				Vanadium	39.6	mg/kg	2.52E-10	mg/kg-day	--	--	--	7.05E-10	mg/kg-day	--	--	--
				Aroclor 1254	0.856	mg/kg	5.44E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-11	1.52E-11	mg/kg-day	--	--	--
				Aroclor 1260	0.358	mg/kg	2.27E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-12	6.37E-12	mg/kg-day	--	--	--
				Dimethylphthalate	1.34	mg/kg	8.51E-12	mg/kg-day	--	--	--	2.38E-11	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0174	mg/kg	1.11E-13	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	3.E-13	3.10E-13	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	20.26	mg/kg	1.29E-10	mg/kg-day	--	--	--	3.60E-10	mg/kg-day	--	--	--
				2,4-Dinitrotoluene	9.533	mg/kg	6.06E-11	mg/kg-day	--	--	--	1.70E-10	mg/kg-day	--	--	--
				Dinitrotoluene Mix	9.628	mg/kg	6.12E-11	mg/kg-day	--	--	--	1.71E-10	mg/kg-day	--	--	--
				Aminodinitrotoluenes	8	mg/kg	5.08E-11	mg/kg-day	--	--	--	1.42E-10	mg/kg-day	--	--	--
				RDX	1.51	mg/kg	9.59E-12	mg/kg-day	--	--	--	2.69E-11	mg/kg-day	--	--	--
				Nitroglycerin	400	mg/kg	2.54E-09	mg/kg-day	--	--	--	7.12E-09	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	1.83E-04	mg/kg	1.16E-15	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-10	3.26E-15	mg/kg-day	--	--	--
			Exp. Route Total								8.E-09					1.E-03
		Exposure Point Total									8.E-09					1.E-03
	Exposure Medium Total										8.E-09					1.E-03
Soil Total											4.E-06					9.E-01
											Total of Receptor Risks Across All Media	4.E-06		Total of Receptor Hazards Across All Media		9.E-01

TABLE E.2-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk			Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	13765	mg/kg	2.41E-03	mg/kg-day	--	--	--	6.73E-03	mg/kg-day	1.00E+00	mg/kg-day	7.E-03
				Antimony	2.614	mg/kg	4.57E-07	mg/kg-day	--	--	--	1.28E-06	mg/kg-day	4.00E-04	mg/kg-day	3.E-03
				Arsenic	1.671	mg/kg	2.92E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	4.E-07	8.18E-07	mg/kg-day	3.00E-04	mg/kg-day	3.E-03
				Chromium	22.09	mg/kg	3.86E-06	mg/kg-day	--	--	--	1.08E-05	mg/kg-day	3.00E-03	mg/kg-day	4.E-03
				Cobalt	8.47	mg/kg	1.48E-06	mg/kg-day	--	--	--	4.14E-06	mg/kg-day	2.00E-02	mg/kg-day	2.E-04
				Copper	44.95	mg/kg	7.85E-06	mg/kg-day	--	--	--	2.20E-05	mg/kg-day	4.00E-02	mg/kg-day	5.E-04
				Iron	20993	mg/kg	3.67E-03	mg/kg-day	--	--	--	1.03E-02	mg/kg-day	7.00E-01	mg/kg-day	1.E-02
				Manganese	472.7	mg/kg	8.26E-05	mg/kg-day	--	--	--	2.31E-04	mg/kg-day	2.00E-02	mg/kg-day	1.E-02
				Vanadium	34.92	mg/kg	6.10E-06	mg/kg-day	--	--	--	1.71E-05	mg/kg-day	1.00E-03	mg/kg-day	2.E-02
				Heptachlor epoxide	0.0629	mg/kg	1.10E-08	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	1.E-07	3.08E-08	mg/kg-day	1.30E-05	mg/kg-day	2.E-03
				Aroclor 1254	0.48	mg/kg	8.39E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-07	2.35E-07	mg/kg-day	2.00E-05	mg/kg-day	1.E-02
				Aroclor 1260	0.51	mg/kg	8.91E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-07	2.50E-07	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	1.12E-07	mg/kg-day	--	--	--	3.13E-07	mg/kg-day	4.00E-02	mg/kg-day	8.E-06
				Dimethylphthalate	0.308	mg/kg	5.38E-08	mg/kg-day	--	--	--	1.51E-07	mg/kg-day	1.00E+01	mg/kg-day	2.E-08
				Benzo(a)pyrene	0.0173	mg/kg	3.02E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	2.E-08	8.46E-09	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	1.07E-05	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	3.E-07	2.99E-05	mg/kg-day	5.00E-04	mg/kg-day	6.E-02
				2,4-Dinitrotoluene	13.78	mg/kg	2.41E-06	mg/kg-day	--	--	--	6.74E-06	mg/kg-day	2.00E-03	mg/kg-day	3.E-03
				Dinitrotoluene Mix	13.88	mg/kg	2.43E-06	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	2.E-06	6.79E-06	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	4.79E-06	mg/kg-day	--	--	--	1.34E-05	mg/kg-day	2.00E-03	mg/kg-day	7.E-03
				RDX	0.77	mg/kg	1.35E-07	mg/kg-day	1.10E-01	mg/kg-day $^{-1}$	1.E-08	3.77E-07	mg/kg-day	3.00E-03	mg/kg-day	1.E-04
				Nitroglycerin	32.5	mg/kg	5.68E-06	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	1.E-07	1.59E-05	mg/kg-day	1.00E-04	mg/kg-day	2.E-01
				2,3,7,8-TCDD Equivalents	0.0000604	mg/kg	1.06E-11	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-06	2.95E-11	mg/kg-day	--	--	--
			Exp. Route Total								5.E-06					3.E-01
			Dermal Absorption	Aluminum	13765	mg/kg	1.59E-04	mg/kg-day	--	--	--	4.44E-04	mg/kg-day	1.00E+00	mg/kg-day	4.E-04
				Antimony	2.614	mg/kg	3.01E-08	mg/kg-day	--	--	--	8.44E-08	mg/kg-day	6.00E-05	mg/kg-day	1.E-03
				Arsenic	1.671	mg/kg	5.78E-08	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	9.E-08	1.62E-07	mg/kg-day	3.00E-04	mg/kg-day	5.E-04
				Chromium	22.09	mg/kg	2.55E-07	mg/kg-day	--	--	--	7.13E-07	mg/kg-day	7.50E-05	mg/kg-day	1.E-02
				Cobalt	8.47	mg/kg	9.77E-08	mg/kg-day	--	--	--	2.73E-07	mg/kg-day	2.00E-02	mg/kg-day	1.E-05
				Copper	44.95	mg/kg	5.18E-07	mg/kg-day	--	--	--	1.45E-06	mg/kg-day	4.00E-02	mg/kg-day	4.E-05
				Iron	20993	mg/kg	2.42E-04	mg/kg-day	--	--	--	6.78E-04	mg/kg-day	7.00E-01	mg/kg-day	1.E-03
				Manganese	472.7	mg/kg	5.45E-06	mg/kg-day	--	--	--	1.53E-05	mg/kg-day	8.00E-04	mg/kg-day	2.E-02
				Vanadium	34.92	mg/kg	4.03E-07	mg/kg-day	--	--	--	1.13E-06	mg/kg-day	2.60E-05	mg/kg-day	4.E-02
				Heptachlor epoxide	0.0629	mg/kg	7.25E-09	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	7.E-08	2.03E-08	mg/kg-day	1.30E-05	mg/kg-day	2.E-03
				Aroclor 1254	0.48	mg/kg	7.75E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-07	2.17E-07	mg/kg-day	2.00E-05	mg/kg-day	1.E-02
				Aroclor 1260	0.51	mg/kg	8.23E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-07	2.31E-07	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	7.38E-08	mg/kg-day	--	--	--	2.07E-07	mg/kg-day	4.00E-02	mg/kg-day	5.E-06
				Dimethylphthalate	0.308	mg/kg	3.55E-08	mg/kg-day	--	--	--	9.95E-08	mg/kg-day	1.00E+01	mg/kg-day	1.E-08
				Benzo(a)pyrene	0.0173	mg/kg	2.59E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	2.E-08	7.26E-09	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	2.11E-06	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	6.E-08	5.92E-06	mg/kg-day	5.00E-04	mg/kg-day	1.E-02
				2,4-Dinitrotoluene	13.78	mg/kg	1.59E-06	mg/kg-day	--	--	--	4.45E-06	mg/kg-day	2.00E-03	mg/kg-day	2.E-03
				Dinitrotoluene Mix	13.88	mg/kg	1.60E-06	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	1.E-06	4.48E-06	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	1.90E-07	mg/kg-day	--	--	--	5.32E-07	mg/kg-day	2.00E-03	mg/kg-day	3.E-04
				RDX	0.77	mg/kg	1.33E-08	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	4.E-10	3.73E-08	mg/kg-day	3.00E-03	mg/kg-day	1.E-05
				Nitroglycerin	32.5	mg/kg	3.75E-07	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	6.E-09	1.05E-06	mg/kg-day	1.00E-04	mg/kg-day	1.E-02
				2,3,7,8-TCDD Equivalents	0.0000604	mg/kg	2.09E-12	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	3.E-07	5.85E-12	mg/kg-day	--	--	--
			Exp. Route Total								2.E-06					1.E-01
		Exposure Point Total									7.E-06					4.E-01
	Exposure Medium Total										7.E-06					4.E-01

TABLE E.2-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	13765	mg/kg	5.74E-07	mg/kg-day	--	--	--	1.61E-06	mg/kg-day	1.00E-03	mg/kg-day	2.E-03
				Antimony	2.614	mg/kg	1.09E-10	mg/kg-day	--	--	--	3.05E-10	mg/kg-day	--	--	--
				Arsenic	1.671	mg/kg	6.97E-11	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	1.E-09	1.95E-10	mg/kg-day	--	--	--
				Chromium	22.09	mg/kg	9.22E-10	mg/kg-day	4.20E+01	mg/kg-day $^{-1}$	4.E-08	2.58E-09	mg/kg-day	3.00E-05	mg/kg-day	9.E-05
				Cobalt	8.47	mg/kg	3.53E-10	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	3.E-09	9.90E-10	mg/kg-day	5.70E-06	mg/kg-day	2.E-04
				Copper	44.95	mg/kg	1.88E-09	mg/kg-day	--	--	--	5.25E-09	mg/kg-day	--	--	--
				Iron	20993	mg/kg	8.76E-07	mg/kg-day	--	--	--	2.45E-06	mg/kg-day	--	--	--
				Manganese	472.7	mg/kg	1.97E-08	mg/kg-day	--	--	--	5.52E-08	mg/kg-day	1.40E-05	mg/kg-day	4.E-03
				Vanadium	34.92	mg/kg	1.46E-09	mg/kg-day	--	--	--	4.08E-09	mg/kg-day	--	--	--
				Heptachlor epoxide	0.0629	mg/kg	2.62E-12	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	2.E-11	7.35E-12	mg/kg-day	--	--	--
				Aroclor 1254	0.48	mg/kg	2.00E-11	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-11	5.61E-11	mg/kg-day	--	--	--
				Aroclor 1260	0.51	mg/kg	2.13E-11	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-11	5.96E-11	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	2.67E-11	mg/kg-day	--	--	--	7.48E-11	mg/kg-day	--	--	--
				Dimethylphthalate	0.308	mg/kg	1.29E-11	mg/kg-day	--	--	--	3.60E-11	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0173	mg/kg	7.22E-13	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	2.E-12	2.02E-12	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	2.55E-09	mg/kg-day	--	--	--	7.14E-09	mg/kg-day	--	--	--
				2,4-Dinitrotoluene	13.78	mg/kg	5.75E-10	mg/kg-day	--	--	--	1.61E-09	mg/kg-day	--	--	--
				Dinitrotoluene Mix	13.88	mg/kg	5.79E-10	mg/kg-day	--	--	--	1.62E-09	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	1.14E-09	mg/kg-day	--	--	--	3.21E-09	mg/kg-day	--	--	--
				RDX	0.77	mg/kg	3.21E-11	mg/kg-day	--	--	--	9.00E-11	mg/kg-day	--	--	--
				Nitroglycerin	32.5	mg/kg	1.36E-09	mg/kg-day	--	--	--	3.80E-09	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	0.0000604	mg/kg	2.52E-15	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	4.E-10	7.06E-15	mg/kg-day	--	--	--
			Exp. Route Total								4.E-08					6.E-03
		Exposure Point Total									4.E-08					6.E-03
	Exposure Medium Total										4.E-08					6.E-03
Soil Total											7.E-06					4.E-01
Groundwater	Groundwater	Groundwater used for Tapwater	Ingestion	Manganese	72.1	ug/L	2.52E-04	mg/kg-day	--	--	--	7.05E-04	mg/kg-day	2.00E-02	mg/kg-day	4.E-02
			Exp. Route Total								--					4.E-02
			Dermal Abs.	Manganese	72.1	ug/L	2.02E-07	mg/kg-day	--	--	--	5.64E-07	mg/kg-day	8.00E-04	mg/kg-day	7.E-04
			Exp. Route Total								--					7.E-04
		Exposure Point Total									--					4.E-02
	Exposure Medium Total										--					4.E-02
Groundwater Total											--					4.E-02
Total of Receptor Risks Across All Media											7.E-06	Total of Receptor Hazards Across All Media				5.E-01

TABLE E.2-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	13765	mg/kg	6.35E-04	mg/kg-day	--	--	--	4.44E-02	mg/kg-day	1.00E+00	mg/kg-day	4.E-02
				Antimony	2.614	mg/kg	1.21E-07	mg/kg-day	--	--	--	8.44E-06	mg/kg-day	2.00E-04	mg/kg-day	4.E-02
				Arsenic	1.671	mg/kg	7.71E-08	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	1.E-07	5.40E-06	mg/kg-day	3.00E-04	mg/kg-day	2.E-02
				Chromium	22.09	mg/kg	1.02E-06	mg/kg-day	--	--	--	7.13E-05	mg/kg-day	2.00E-02	mg/kg-day	4.E-03
				Cobalt	8.47	mg/kg	3.91E-07	mg/kg-day	--	--	--	2.73E-05	mg/kg-day	2.00E-02	mg/kg-day	1.E-03
				Copper	44.95	mg/kg	2.07E-06	mg/kg-day	--	--	--	1.45E-04	mg/kg-day	4.00E-02	mg/kg-day	4.E-03
				Iron	20993	mg/kg	9.68E-04	mg/kg-day	--	--	--	6.78E-02	mg/kg-day	7.00E-01	mg/kg-day	1.E-01
				Manganese	472.7	mg/kg	2.18E-05	mg/kg-day	--	--	--	1.53E-03	mg/kg-day	2.00E-02	mg/kg-day	8.E-02
				Vanadium	34.92	mg/kg	1.61E-06	mg/kg-day	--	--	--	1.13E-04	mg/kg-day	7.00E-03	mg/kg-day	2.E-02
				Heptachlor epoxide	0.0629	mg/kg	2.90E-09	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	3.E-08	2.03E-07	mg/kg-day	1.30E-05	mg/kg-day	2.E-02
				Aroclor 1254	0.48	mg/kg	2.21E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-08	1.55E-06	mg/kg-day	5.00E-05	mg/kg-day	3.E-02
				Aroclor 1260	0.51	mg/kg	2.35E-08	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-08	1.65E-06	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	2.95E-08	mg/kg-day	--	--	--	2.07E-06	mg/kg-day	4.00E-01	mg/kg-day	5.E-06
				Dimethylphthalate	0.308	mg/kg	1.42E-08	mg/kg-day	--	--	--	9.95E-07	mg/kg-day	1.00E+01	mg/kg-day	1.E-07
				Benzo(a)pyrene	0.0173	mg/kg	7.98E-10	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	6.E-09	5.59E-08	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	2.82E-06	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	8.E-08	1.97E-04	mg/kg-day	5.00E-04	mg/kg-day	4.E-01
				2,4-Dinitrotoluene	13.78	mg/kg	6.36E-07	mg/kg-day	--	--	--	4.45E-05	mg/kg-day	2.00E-03	mg/kg-day	2.E-02
				Dinitrotoluene Mix	13.88	mg/kg	6.40E-07	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	4.E-07	4.48E-05	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	1.27E-06	mg/kg-day	--	--	--	8.86E-05	mg/kg-day	2.00E-03	mg/kg-day	4.E-02
				RDX	0.77	mg/kg	3.55E-08	mg/kg-day	1.10E-01	mg/kg-day $^{-1}$	4.E-09	2.49E-06	mg/kg-day	3.00E-03	mg/kg-day	8.E-04
				Nitroglycerin	32.5	mg/kg	1.50E-06	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	3.E-08	1.05E-04	mg/kg-day	1.00E-04	mg/kg-day	1.E+00
				2,3,7,8-TCDD Equivalents	0.0000604	mg/kg	2.79E-12	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	4.E-07	1.95E-10	mg/kg-day	--	--	--
			Exp. Route Total								1.E-06					1.9.E+00
			Dermal Absorption	Aluminum	13765	mg/kg	1.90E-05	mg/kg-day	--	--	--	1.33E-03	mg/kg-day	1.00E+00	mg/kg-day	1.E-03
				Antimony	2.614	mg/kg	3.62E-09	mg/kg-day	--	--	--	2.53E-07	mg/kg-day	3.00E-05	mg/kg-day	8.E-03
				Arsenic	1.671	mg/kg	6.94E-09	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	1.E-08	4.86E-07	mg/kg-day	3.00E-04	mg/kg-day	2.E-03
				Chromium	22.09	mg/kg	3.06E-08	mg/kg-day	--	--	--	2.14E-06	mg/kg-day	5.00E-04	mg/kg-day	4.E-03
				Cobalt	8.47	mg/kg	1.17E-08	mg/kg-day	--	--	--	8.20E-07	mg/kg-day	2.00E-02	mg/kg-day	4.E-05
				Copper	44.95	mg/kg	6.22E-08	mg/kg-day	--	--	--	4.35E-06	mg/kg-day	4.00E-02	mg/kg-day	1.E-04
				Iron	20993	mg/kg	2.91E-05	mg/kg-day	--	--	--	2.03E-03	mg/kg-day	7.00E-01	mg/kg-day	3.E-03
				Manganese	472.7	mg/kg	6.54E-07	mg/kg-day	--	--	--	4.58E-05	mg/kg-day	8.00E-04	mg/kg-day	6.E-02
				Vanadium	34.92	mg/kg	4.83E-08	mg/kg-day	--	--	--	3.38E-06	mg/kg-day	1.80E-04	mg/kg-day	2.E-02
				Heptachlor epoxide	0.0629	mg/kg	8.70E-10	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	8.E-09	6.09E-08	mg/kg-day	1.30E-05	mg/kg-day	5.E-03
				Aroclor 1254	0.48	mg/kg	9.30E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.9.E-08	6.51E-07	mg/kg-day	5.00E-05	mg/kg-day	1.E-02
				Aroclor 1260	0.51	mg/kg	9.88E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-08	6.92E-07	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	8.86E-09	mg/kg-day	--	--	--	6.20E-07	mg/kg-day	4.00E-01	mg/kg-day	2.E-06
				Dimethylphthalate	0.308	mg/kg	4.26E-09	mg/kg-day	--	--	--	2.98E-07	mg/kg-day	1.00E+01	mg/kg-day	3.E-08
				Benzo(a)pyrene	0.0173	mg/kg	3.11E-10	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	2.E-09	2.18E-08	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	2.54E-07	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	8.E-09	1.78E-05	mg/kg-day	5.00E-04	mg/kg-day	4.E-02
				2,4-Dinitrotoluene	13.78	mg/kg	1.91E-07	mg/kg-day	--	--	--	1.33E-05	mg/kg-day	2.00E-03	mg/kg-day	7.E-03
				Dinitrotoluene Mix	13.88	mg/kg	1.92E-07	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	1.E-07	1.34E-05	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	2.28E-08	mg/kg-day	--	--	--	1.59E-06	mg/kg-day	2.00E-03	mg/kg-day	8.E-04
				RDX	0.77	mg/kg	1.60E-09	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	5.E-11	1.12E-07	mg/kg-day	3.00E-03	mg/kg-day	4.E-05
				Nitroglycerin	32.5	mg/kg	4.50E-08	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	8.E-10	3.15E-06	mg/kg-day	1.00E-04	mg/kg-day	3.E-02
				2,3,7,8-TCDD Equivalents	6.04E-05	mg/kg	2.51E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	3.8.E-08	1.76E-11	mg/kg-day	--	--	--
			Exp. Route Total								2.E-07					2.E-01
		Exposure Point Total									1.4.E-06					2.0.E+00
	Exposure Medium Total										1.4.E-06					2.0.E+00

TABLE E.2-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	13765	mg/kg	3.26E-05	mg/kg-day	--	--	--	2.28E-03	mg/kg-day	1.00E-03	mg/kg-day	2.E+00
				Antimony	2.614	mg/kg	6.19E-09	mg/kg-day	--	--	--	4.33E-07	mg/kg-day	1.10E-04	mg/kg-day	4.E-03
				Arsenic	1.671	mg/kg	3.96E-09	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	6.E-08	2.77E-07	mg/kg-day	--	--	--
				Chromium	22.09	mg/kg	5.23E-08	mg/kg-day	4.20E+01	mg/kg-day $^{-1}$	2.E-06	3.66E-06	mg/kg-day	3.00E-05	mg/kg-day	1.E-01
				Cobalt	8.47	mg/kg	2.00E-08	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	2.E-07	1.40E-06	mg/kg-day	5.70E-06	mg/kg-day	2.E-01
				Copper	44.95	mg/kg	1.06E-07	mg/kg-day	--	--	--	7.45E-06	mg/kg-day	--	--	--
				Iron	20993	mg/kg	4.97E-05	mg/kg-day	--	--	--	3.48E-03	mg/kg-day	--	--	--
				Manganese	472.7	mg/kg	1.12E-06	mg/kg-day	--	--	--	7.83E-05	mg/kg-day	1.40E-05	mg/kg-day	6.E+00
				Vanadium	34.92	mg/kg	8.27E-08	mg/kg-day	--	--	--	5.79E-06	mg/kg-day	--	--	--
				Heptachlor epoxide	0.0629	mg/kg	1.49E-10	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	1.E-09	1.04E-08	mg/kg-day	--	--	--
				Aroclor 1254	0.48	mg/kg	1.14E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-09	7.95E-08	mg/kg-day	--	--	--
				Aroclor 1260	0.51	mg/kg	1.21E-09	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-09	8.45E-08	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	1.51E-09	mg/kg-day	--	--	--	1.06E-07	mg/kg-day	--	--	--
				Dimethylphthalate	0.308	mg/kg	7.29E-10	mg/kg-day	--	--	--	5.10E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0173	mg/kg	4.10E-11	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	1.E-10	2.87E-09	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	1.45E-07	mg/kg-day	--	--	--	1.01E-05	mg/kg-day	--	--	--
				2,4-Dinitrotoluene	13.78	mg/kg	3.26E-08	mg/kg-day	--	--	--	2.28E-06	mg/kg-day	--	--	--
				Dinitrotoluene Mix	13.88	mg/kg	3.29E-08	mg/kg-day	--	--	--	2.30E-06	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	6.50E-08	mg/kg-day	--	--	--	4.55E-06	mg/kg-day	--	--	--
				RDX	0.77	mg/kg	1.82E-09	mg/kg-day	--	--	--	1.28E-07	mg/kg-day	--	--	--
				Nitroglycerin	32.5	mg/kg	7.69E-08	mg/kg-day	--	--	--	5.39E-06	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	6.04E-05	mg/kg	1.43E-13	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-08	1.00E-11	mg/kg-day	--	--	--
			Exp. Route Total								2.5.E-06					8.2.E+00
		Exposure Point Total									2.5.E-06					8.2.E+00
	Exposure Medium Total										2.5.E-06					8.2.E+00
Soil Total											4.E-06					1.E+01
Groundwater	Groundwater	Groundwater	Ingestion	Manganese	72.1	ug/L	1.01E-07	mg/kg-day	--	--	--	7.05E-06	mg/kg-day	2.00E-02	mg/kg-day	4.E-04
			Exp. Route Total								--					4.E-04
			Dermal	Manganese	72.1	ug/L	6.65E-08	mg/kg-day	--	--	--	4.66E-06	mg/kg-day	8.00E-04	mg/kg-day	6.E-03
			Exp. Route Total								--					6.E-03
		Exposure Point Total									--					6.E-03
	Exposure Medium Total										--					6.E-03
Groundwater Total											--					6.E-03
Total of Receptor Risks Across All Media											4.E-06	Total of Receptor Hazards Across All Media				1.E+01

TABLE E.2-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk			Intake/Exposure Concentration		RfD/RfC		
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	Hazard Quotient
Total Soil	Soil	Soil	Ingestion	Aluminum	13765	mg/kg	6.46E-03	mg/kg-day	--	--	--	1.89E-02	mg/kg-day	1.00E+00	mg/kg-day	2.E-02
				Antimony	2.614	mg/kg	1.23E-06	mg/kg-day	--	--	--	3.58E-06	mg/kg-day	4.00E-04	mg/kg-day	9.E-03
				Arsenic	1.671	mg/kg	7.85E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	1.E-06	2.29E-06	mg/kg-day	3.00E-04	mg/kg-day	8.E-03
				Chromium	22.09	mg/kg	1.04E-05	mg/kg-day	--	--	--	3.03E-05	mg/kg-day	3.00E-03	mg/kg-day	1.E-02
				Cobalt	8.47	mg/kg	3.98E-06	mg/kg-day	--	--	--	1.16E-05	mg/kg-day	2.00E-02	mg/kg-day	6.E-04
				Copper	44.95	mg/kg	2.11E-05	mg/kg-day	--	--	--	6.16E-05	mg/kg-day	4.00E-02	mg/kg-day	2.E-03
				Iron	20993	mg/kg	9.86E-03	mg/kg-day	--	--	--	2.88E-02	mg/kg-day	7.00E-01	mg/kg-day	4.E-02
				Manganese	472.7	mg/kg	2.22E-04	mg/kg-day	--	--	--	6.48E-04	mg/kg-day	2.00E-02	mg/kg-day	3.E-02
				Vanadium	34.92	mg/kg	1.64E-05	mg/kg-day	--	--	--	4.78E-05	mg/kg-day	1.00E-03	mg/kg-day	5.E-02
				Heptachlor epoxide	0.0629	mg/kg	2.95E-08	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	3.E-07	8.62E-08	mg/kg-day	1.30E-05	mg/kg-day	7.E-03
				Aroclor 1254	0.48	mg/kg	2.25E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-07	6.58E-07	mg/kg-day	2.00E-05	mg/kg-day	3.E-02
				Aroclor 1260	0.51	mg/kg	2.40E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	5.E-07	6.99E-07	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	3.01E-07	mg/kg-day	--	--	--	8.77E-07	mg/kg-day	4.00E-02	mg/kg-day	2.E-05
				Dimethylphthalate	0.308	mg/kg	1.45E-07	mg/kg-day	--	--	--	4.22E-07	mg/kg-day	1.00E+01	mg/kg-day	4.E-08
				Benzo(a)pyrene*	0.0173	mg/kg	8.13E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	1.E-07	2.37E-08	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	2.87E-05	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	9.E-07	8.37E-05	mg/kg-day	5.00E-04	mg/kg-day	2.E-01
				2,4-Dinitrotoluene	13.78	mg/kg	6.47E-06	mg/kg-day	--	--	--	1.89E-05	mg/kg-day	2.00E-03	mg/kg-day	9.E-03
				Dinitrotoluene Mix	13.88	mg/kg	6.52E-06	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	4.E-06	1.90E-05	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	1.29E-05	mg/kg-day	--	--	--	3.76E-05	mg/kg-day	2.00E-03	mg/kg-day	2.E-02
				RDX	0.77	mg/kg	3.62E-07	mg/kg-day	1.10E-01	mg/kg-day $^{-1}$	4.E-08	1.05E-06	mg/kg-day	3.00E-03	mg/kg-day	4.E-04
				Nitroglycerin	32.5	mg/kg	1.53E-05	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	3.E-07	4.45E-05	mg/kg-day	1.00E-04	mg/kg-day	4.E-01
				2,3,7,8-TCDD Equivalents	0.0000604	mg/kg	2.84E-11	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	4.E-06	8.27E-11	mg/kg-day	--	--	--
			Exp. Route Total								1.E-05					8.E-01
			Dermal Absorption	Aluminum	13765	mg/kg	2.58E-04	mg/kg-day	--	--	--	7.52E-04	mg/kg-day	1.00E+00	mg/kg-day	8.E-04
				Antimony	2.614	mg/kg	4.90E-08	mg/kg-day	--	--	--	1.43E-07	mg/kg-day	6.00E-05	mg/kg-day	2.E-03
				Arsenic	1.671	mg/kg	9.39E-08	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	1.E-07	2.74E-07	mg/kg-day	3.00E-04	mg/kg-day	9.E-04
				Chromium	22.09	mg/kg	4.14E-07	mg/kg-day	--	--	--	1.21E-06	mg/kg-day	7.50E-05	mg/kg-day	2.E-02
				Cobalt	8.47	mg/kg	1.59E-07	mg/kg-day	--	--	--	4.63E-07	mg/kg-day	2.00E-02	mg/kg-day	2.E-05
				Copper	44.95	mg/kg	8.42E-07	mg/kg-day	--	--	--	2.46E-06	mg/kg-day	4.00E-02	mg/kg-day	6.E-05
				Iron	20993	mg/kg	3.93E-04	mg/kg-day	--	--	--	1.15E-03	mg/kg-day	7.00E-01	mg/kg-day	2.E-03
				Manganese	472.7	mg/kg	8.86E-06	mg/kg-day	--	--	--	2.58E-05	mg/kg-day	8.00E-04	mg/kg-day	3.E-02
				Vanadium	34.92	mg/kg	6.54E-07	mg/kg-day	--	--	--	1.91E-06	mg/kg-day	2.60E-05	mg/kg-day	7.E-02
				Heptachlor epoxide	0.0629	mg/kg	1.18E-08	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	1.E-07	3.44E-08	mg/kg-day	1.30E-05	mg/kg-day	3.E-03
				Aroclor 1254	0.48	mg/kg	1.26E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-07	3.67E-07	mg/kg-day	2.00E-05	mg/kg-day	2.E-02
				Aroclor 1260	0.51	mg/kg	1.34E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-07	3.90E-07	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	1.20E-07	mg/kg-day	--	--	--	3.50E-07	mg/kg-day	4.00E-02	mg/kg-day	9.E-06
				Dimethylphthalate	0.308	mg/kg	5.77E-08	mg/kg-day	--	--	--	1.68E-07	mg/kg-day	1.00E+01	mg/kg-day	2.E-08
				Benzo(a)pyrene*	0.0173	mg/kg	4.21E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	6.E-08	1.23E-08	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	3.43E-06	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	1.E-07	1.00E-05	mg/kg-day	5.00E-04	mg/kg-day	2.E-02
				2,4-Dinitrotoluene	13.78	mg/kg	2.58E-06	mg/kg-day	--	--	--	7.53E-06	mg/kg-day	2.00E-03	mg/kg-day	4.E-03
				Dinitrotoluene Mix	13.88	mg/kg	2.60E-06	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	2.E-06	7.59E-06	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	3.09E-07	mg/kg-day	--	--	--	9.00E-07	mg/kg-day	2.00E-03	mg/kg-day	4.E-04
				RDX	0.77	mg/kg	2.16E-08	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	6.E-10	6.31E-08	mg/kg-day	3.00E-03	mg/kg-day	2.E-05
				Nitroglycerin	32.5	mg/kg	6.09E-07	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	1.E-08	1.78E-06	mg/kg-day	1.00E-04	mg/kg-day	2.E-02
				2,3,7,8-TCDD Equivalents	6.04E-05	mg/kg	3.40E-12	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	5.E-07	9.90E-12	mg/kg-day	--	--	--
			Exp. Route Total								3.E-06					2.E-01
		Exposure Point Total									2.E-05					1.E+00
	Exposure Medium Total										2.E-05					1.E+00

TABLE E.2-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	13765	mg/kg	1.22E-07	mg/kg-day	--	--	--	3.55E-07	mg/kg-day	1.00E-03	mg/kg-day	4.E-04
				Antimony	2.614	mg/kg	2.31E-11	mg/kg-day	--	--	--	6.73E-11	mg/kg-day	--	--	--
				Arsenic	1.671	mg/kg	1.48E-11	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	2.E-10	4.30E-11	mg/kg-day	--	--	--
				Chromium	22.09	mg/kg	1.95E-10	mg/kg-day	4.20E+01	mg/kg-day $^{-1}$	8.E-09	5.69E-10	mg/kg-day	3.00E-05	mg/kg-day	2.E-05
				Cobalt	8.47	mg/kg	7.48E-11	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	7.E-10	2.18E-10	mg/kg-day	5.70E-06	mg/kg-day	4.E-05
				Copper	44.95	mg/kg	3.97E-10	mg/kg-day	--	--	--	1.16E-09	mg/kg-day	--	--	--
				Iron	20993	mg/kg	1.85E-07	mg/kg-day	--	--	--	5.41E-07	mg/kg-day	--	--	--
				Manganese	472.7	mg/kg	4.18E-09	mg/kg-day	--	--	--	1.22E-08	mg/kg-day	1.40E-05	mg/kg-day	9.E-04
				Vanadium	34.92	mg/kg	3.08E-10	mg/kg-day	--	--	--	9.00E-10	mg/kg-day	--	--	--
				Heptachlor epoxide	0.0629	mg/kg	5.56E-13	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	5.E-12	1.62E-12	mg/kg-day	--	--	--
				Aroclor 1254	0.48	mg/kg	4.24E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	8.E-12	1.24E-11	mg/kg-day	--	--	--
				Aroclor 1260	0.51	mg/kg	4.50E-12	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	9.E-12	1.31E-11	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	5.65E-12	mg/kg-day	--	--	--	1.65E-11	mg/kg-day	--	--	--
				Dimethylphthalate	0.308	mg/kg	2.72E-12	mg/kg-day	--	--	--	7.93E-12	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0173	mg/kg	1.53E-13	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	9.E-13	4.46E-13	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	5.40E-10	mg/kg-day	--	--	--	1.57E-09	mg/kg-day	--	--	--
				2,4-Dinitrotoluene	13.78	mg/kg	1.22E-10	mg/kg-day	--	--	--	3.55E-10	mg/kg-day	--	--	--
				Dinitrotoluene Mix	13.88	mg/kg	1.23E-10	mg/kg-day	--	--	--	3.58E-10	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	2.42E-10	mg/kg-day	--	--	--	7.07E-10	mg/kg-day	--	--	--
				RDX	0.77	mg/kg	6.80E-12	mg/kg-day	--	--	--	1.98E-11	mg/kg-day	--	--	--
				Nitroglycerin	32.5	mg/kg	2.87E-10	mg/kg-day	--	--	--	8.37E-10	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	6.04E-05	mg/kg	5.34E-16	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	8.E-11	1.56E-15	mg/kg-day	--	--	--
			Exp. Route Total								9.E-09					1.E-03
		Exposure Point Total									9.E-09					1.E-03
	Exposure Medium Total										9.E-09					1.E-03
Soil Total											2.E-05					1.E+00
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Manganese	72.1	ug/L	6.77E-04	mg/kg-day	--	--	--	1.98E-03	mg/kg-day	2.00E-02	mg/kg-day	1.E-01
			Exp. Route Total								--					1.E-01
			Dermal Abs.	Manganese	72.1	ug/L	3.54E-06	mg/kg-day	--	--	--	1.03E-05	mg/kg-day	8.00E-04	mg/kg-day	1.E-02
			Exp. Route Total								--					1.E-02
		Exposure Point Total									--					1.E-01
	Exposure Medium Total										--					1.E-01
Groundwater Total											--					1.E-01
											Total of Receptor Risks Across All Media	2.E-05		Total of Receptor Hazards Across All Media		1.E+00

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.2-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	13765	mg/kg	1.51E-02	mg/kg-day	--	--	--	1.76E-01	mg/kg-day	1.00E+00	mg/kg-day	2.E-01
				Antimony	2.614	mg/kg	2.86E-06	mg/kg-day	--	--	--	3.34E-05	mg/kg-day	4.00E-04	mg/kg-day	8.E-02
				Arsenic	1.671	mg/kg	1.83E-06	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	3.E-06	2.14E-05	mg/kg-day	3.00E-04	mg/kg-day	7.E-02
				Chromium	22.09	mg/kg	2.42E-05	mg/kg-day	--	--	--	2.82E-04	mg/kg-day	3.00E-03	mg/kg-day	9.E-02
				Cobalt	8.47	mg/kg	9.28E-06	mg/kg-day	--	--	--	1.08E-04	mg/kg-day	2.00E-02	mg/kg-day	5.E-03
				Copper	44.95	mg/kg	4.93E-05	mg/kg-day	--	--	--	5.75E-04	mg/kg-day	4.00E-02	mg/kg-day	1.E-02
				Iron	20993	mg/kg	2.30E-02	mg/kg-day	--	--	--	2.68E-01	mg/kg-day	7.00E-01	mg/kg-day	4.E-01
				Manganese	472.7	mg/kg	5.18E-04	mg/kg-day	--	--	--	6.04E-03	mg/kg-day	2.00E-02	mg/kg-day	3.E-01
				Vanadium	34.92	mg/kg	3.83E-05	mg/kg-day	--	--	--	4.46E-04	mg/kg-day	1.00E-03	mg/kg-day	4.E-01
				Heptachlor epoxide	0.0629	mg/kg	6.89E-08	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	6.E-07	8.04E-07	mg/kg-day	1.30E-05	mg/kg-day	6.E-02
				Aroclor 1254	0.48	mg/kg	5.26E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-06	6.14E-06	mg/kg-day	2.00E-05	mg/kg-day	3.E-01
				Aroclor 1260	0.51	mg/kg	5.59E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	1.E-06	6.52E-06	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	7.01E-07	mg/kg-day	--	--	--	8.18E-06	mg/kg-day	4.00E-02	mg/kg-day	2.E-04
				Dimethylphthalate	0.308	mg/kg	3.38E-07	mg/kg-day	--	--	--	3.94E-06	mg/kg-day	1.00E+01	mg/kg-day	4.E-07
				Benzo(a)pyrene*	0.0173	mg/kg	1.90E-08	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	7.E-07	2.21E-07	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	6.70E-05	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	2.E-06	7.81E-04	mg/kg-day	5.00E-04	mg/kg-day	2.E+00
				2,4-Dinitrotoluene	13.78	mg/kg	1.51E-05	mg/kg-day	--	--	--	1.76E-04	mg/kg-day	2.00E-03	mg/kg-day	9.E-02
				Dinitrotoluene Mix	13.88	mg/kg	1.52E-05	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	1.E-05	1.77E-04	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	3.01E-05	mg/kg-day	--	--	--	3.51E-04	mg/kg-day	2.00E-03	mg/kg-day	2.E-01
				RDX	0.77	mg/kg	8.44E-07	mg/kg-day	1.10E-01	mg/kg-day $^{-1}$	9.E-08	9.84E-06	mg/kg-day	3.00E-03	mg/kg-day	3.E-03
				Nitroglycerin	32.5	mg/kg	3.56E-05	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	6.E-07	4.16E-04	mg/kg-day	1.00E-04	mg/kg-day	4.E+00
				2,3,7,8-TCDD Equivalents	6.04E-05	mg/kg	6.62E-11	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	1.E-05	7.72E-10	mg/kg-day	--	--	--
			Exp. Route Total								3.E-05					8.E+00
			Dermal Absorption	Aluminum	13765	mg/kg	4.22E-04	mg/kg-day	--	--	--	4.93E-03	mg/kg-day	1.00E+00	mg/kg-day	5.E-03
				Antimony	2.614	mg/kg	8.02E-08	mg/kg-day	--	--	--	9.36E-07	mg/kg-day	6.00E-05	mg/kg-day	2.E-02
				Arsenic	1.671	mg/kg	1.54E-07	mg/kg-day	1.50E+00	mg/kg-day $^{-1}$	2.E-07	1.79E-06	mg/kg-day	3.00E-04	mg/kg-day	6.E-03
				Chromium	22.09	mg/kg	6.78E-07	mg/kg-day	--	--	--	7.91E-06	mg/kg-day	7.50E-05	mg/kg-day	1.E-01
				Cobalt	8.47	mg/kg	2.60E-07	mg/kg-day	--	--	--	3.03E-06	mg/kg-day	2.00E-02	mg/kg-day	2.E-04
				Copper	44.95	mg/kg	1.38E-06	mg/kg-day	--	--	--	1.61E-05	mg/kg-day	4.00E-02	mg/kg-day	4.E-04
				Iron	20993	mg/kg	6.44E-04	mg/kg-day	--	--	--	7.52E-03	mg/kg-day	7.00E-01	mg/kg-day	1.E-02
				Manganese	472.7	mg/kg	1.45E-05	mg/kg-day	--	--	--	1.69E-04	mg/kg-day	8.00E-04	mg/kg-day	2.E-01
				Vanadium	34.92	mg/kg	1.07E-06	mg/kg-day	--	--	--	1.25E-05	mg/kg-day	2.60E-05	mg/kg-day	5.E-01
				Heptachlor epoxide	0.0629	mg/kg	1.93E-08	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	2.E-07	2.25E-07	mg/kg-day	1.30E-05	mg/kg-day	2.E-02
				Aroclor 1254	0.48	mg/kg	2.06E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-07	2.41E-06	mg/kg-day	2.00E-05	mg/kg-day	1.E-01
				Aroclor 1260	0.51	mg/kg	2.19E-07	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	4.E-07	2.56E-06	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	1.96E-07	mg/kg-day	--	--	--	2.29E-06	mg/kg-day	4.00E-02	mg/kg-day	6.E-05
				Dimethylphthalate	0.308	mg/kg	9.45E-08	mg/kg-day	--	--	--	1.10E-06	mg/kg-day	1.00E+01	mg/kg-day	1.E-07
				Benzo(a)pyrene*	0.0173	mg/kg	6.90E-09	mg/kg-day	7.30E+00	mg/kg-day $^{-1}$	3.E-07	8.05E-08	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	5.62E-06	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	2.E-07	6.56E-05	mg/kg-day	5.00E-04	mg/kg-day	1.E-01
				2,4-Dinitrotoluene	13.78	mg/kg	4.23E-06	mg/kg-day	--	--	--	4.93E-05	mg/kg-day	2.00E-03	mg/kg-day	2.E-02
				Dinitrotoluene Mix	13.88	mg/kg	4.26E-06	mg/kg-day	6.80E-01	mg/kg-day $^{-1}$	3.E-06	4.97E-05	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	5.05E-07	mg/kg-day	--	--	--	5.89E-06	mg/kg-day	2.00E-03	mg/kg-day	3.E-03
				RDX	0.77	mg/kg	3.54E-08	mg/kg-day	3.00E-02	mg/kg-day $^{-1}$	1.E-09	4.13E-07	mg/kg-day	3.00E-03	mg/kg-day	1.E-04
				Nitroglycerin	32.5	mg/kg	9.97E-07	mg/kg-day	1.70E-02	mg/kg-day $^{-1}$	2.E-08	1.16E-05	mg/kg-day	1.00E-04	mg/kg-day	1.E-01
				2,3,7,8-TCDD Equivalents	6.04E-05	mg/kg	5.56E-12	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	8.E-07	6.49E-11	mg/kg-day	--	--	--
			Exp. Route Total								5.E-06					1.E+00
		Exposure Point Total									3.E-05					9.E+00
	Exposure Medium Total										3.E-05					9.E+00

TABLE E.2-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	13765	mg/kg	3.38E-07	mg/kg-day	--	--	--	3.94E-06	mg/kg-day	1.00E-03	mg/kg-day	4.E-03
				Antimony	2.614	mg/kg	6.41E-11	mg/kg-day	--	--	--	7.48E-10	mg/kg-day	--	--	--
				Arsenic	1.671	mg/kg	4.10E-11	mg/kg-day	1.50E+01	mg/kg-day $^{-1}$	6.E-10	4.78E-10	mg/kg-day	--	--	--
				Chromium	22.09	mg/kg	5.42E-10	mg/kg-day	4.20E+01	mg/kg-day $^{-1}$	2.3.E-08	6.32E-09	mg/kg-day	3.00E-05	mg/kg-day	2.E-04
				Cobalt	8.47	mg/kg	2.08E-10	mg/kg-day	9.80E+00	mg/kg-day $^{-1}$	2.E-09	2.42E-09	mg/kg-day	5.70E-06	mg/kg-day	4.E-04
				Copper	44.95	mg/kg	1.10E-09	mg/kg-day	--	--	--	1.29E-08	mg/kg-day	--	--	--
				Iron	20993	mg/kg	5.15E-07	mg/kg-day	--	--	--	6.01E-06	mg/kg-day	--	--	--
				Manganese	473	mg/kg	1.16E-08	mg/kg-day	--	--	--	1.35E-07	mg/kg-day	1.40E-05	mg/kg-day	1.E-02
				Vanadium	34.92	mg/kg	8.57E-10	mg/kg-day	--	--	--	1.00E-08	mg/kg-day	--	--	--
				Heptachlor epoxide	0.0629	mg/kg	1.54E-12	mg/kg-day	9.10E+00	mg/kg-day $^{-1}$	1.E-11	1.80E-11	mg/kg-day	--	--	--
				Aroclor 1254	0.48	mg/kg	1.18E-11	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	2.E-11	1.37E-10	mg/kg-day	--	--	--
				Aroclor 1260	0.51	mg/kg	1.25E-11	mg/kg-day	2.00E+00	mg/kg-day $^{-1}$	3.E-11	1.46E-10	mg/kg-day	--	--	--
				Di-n-octylphthalate	0.64	mg/kg	1.57E-11	mg/kg-day	--	--	--	1.83E-10	mg/kg-day	--	--	--
				Dimethylphthalate	0.308	mg/kg	7.56E-12	mg/kg-day	--	--	--	8.82E-11	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0173	mg/kg	4.24E-13	mg/kg-day	3.10E+00	mg/kg-day $^{-1}$	7.E-12	4.95E-12	mg/kg-day	--	--	--
				2,4,6-Trinitrotoluene	61.1	mg/kg	1.50E-09	mg/kg-day	--	--	--	1.75E-08	mg/kg-day	--	--	--
				2,4-Dinitrotoluene	13.78	mg/kg	3.38E-10	mg/kg-day	--	--	--	3.94E-09	mg/kg-day	--	--	--
				Dinitrotoluene Mix	13.88	mg/kg	3.41E-10	mg/kg-day	--	--	--	3.97E-09	mg/kg-day	--	--	--
				Aminodinitrotoluenes	27.44	mg/kg	6.73E-10	mg/kg-day	--	--	--	7.85E-09	mg/kg-day	--	--	--
				RDX	0.77	mg/kg	1.89E-11	mg/kg-day	--	--	--	2.20E-10	mg/kg-day	--	--	--
				Nitroglycerin	32.5	mg/kg	7.97E-10	mg/kg-day	--	--	--	9.30E-09	mg/kg-day	--	--	--
				2,3,7,8-TCDD Equivalents	6.04E-05	mg/kg	1.48E-15	mg/kg-day	1.50E+05	mg/kg-day $^{-1}$	2.E-10	1.73E-14	mg/kg-day	--	--	--
			Exp. Route Total								3.E-08					1.E-02
		Exposure Point Total									3.E-08					1.E-02
	Exposure Medium Total										3.E-08					1.E-02
Soil Total											3.E-05					9.E+00
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Manganese	72.1	ug/L	3.95E-04	mg/kg-day	--	--	--	4.61E-03	mg/kg-day	2.00E-02	mg/kg-day	2.3.E-01
			Exp. Route Total								--					2.3.E-01
			Dermal Abs.	Manganese	72.1	ug/L	2.61E-06	mg/kg-day	--	--	--	3.04E-05	mg/kg-day	8.00E-04	mg/kg-day	4.E-02
			Exp. Route Total								--					4.E-02
		Exposure Point Total									--					3.E-01
	Exposure Medium Total										--					3.E-01
Groundwater Total											--					3.E-01
										Total of Receptor Risks Across All Media	3.E-05			Total of Receptor Hazards Across All Media		9.E+00

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.2-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Total Soil	Soil	Soil	Ingestion	Aluminum	13765	mg/kg	--
				Antimony	2.614	mg/kg	--
				Arsenic	1.671	mg/kg	4.E-06
				Chromium	22.09	mg/kg	--
				Cobalt	8.47	mg/kg	--
				Copper	44.95	mg/kg	--
				Iron	20993	mg/kg	--
				Manganese	472.7	mg/kg	--
				Vanadium	34.92	mg/kg	--
				Heptachlor epoxide	0.0629	mg/kg	9.E-07
				Aroclor 1254	0.48	mg/kg	2.E-06
				Aroclor 1260	0.51	mg/kg	2.E-06
				Di-n-octylphthalate	0.64	mg/kg	--
				Dimethylphthalate	0.308	mg/kg	--
				Benzo(a)pyrene*	0.0173	mg/kg	8.E-07
				2,4,6-Trinitrotoluene	61.1	mg/kg	3.E-06
				2,4-Dinitrotoluene	13.78	mg/kg	--
				Dinitrotoluene Mix	13.88	mg/kg	1.5.E-05
				Aminodinitrotoluenes	27.44	mg/kg	--
				RDX	0.77	mg/kg	1.E-07
				Nitroglycerin	32.5	mg/kg	9.E-07
				2,3,7,8-TCDD Equivalents	0.0000604	mg/kg	1.4.E-05
			Exp. Route Total				4.E-05
			Dermal Absorption	Aluminum	13765	mg/kg	--
				Antimony	2.614	mg/kg	--
				Arsenic	1.671	mg/kg	4.E-07
				Chromium	22.09	mg/kg	--
				Cobalt	8.47	mg/kg	--
				Copper	44.95	mg/kg	--
				Iron	20993	mg/kg	--
				Manganese	472.7	mg/kg	--
				Vanadium	34.92	mg/kg	--
				Heptachlor epoxide	0.0629	mg/kg	3.E-07
				Aroclor 1254	0.48	mg/kg	7.E-07
				Aroclor 1260	0.51	mg/kg	7.E-07
				Di-n-octylphthalate	0.64	mg/kg	--
				Dimethylphthalate	0.308	mg/kg	--
				Benzo(a)pyrene*	0.0173	mg/kg	3.E-07
				2,4,6-Trinitrotoluene	61.1	mg/kg	3.E-07
				2,4-Dinitrotoluene	13.78	mg/kg	--
				Dinitrotoluene Mix	13.88	mg/kg	5.E-06
				Aminodinitrotoluenes	27.44	mg/kg	--
				RDX	0.77	mg/kg	2.E-09
				Nitroglycerin	32.5	mg/kg	3.E-08
				2,3,7,8-TCDD Equivalents	0.0000604	mg/kg	1.E-06
			Exp. Route Total				9.E-06
		Exposure Point Total					5.E-05
	Exposure Medium Total						5.E-05

TABLE E.2-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	13765	mg/kg	--
				Antimony	2.614	mg/kg	--
				Arsenic	1.671	mg/kg	8.E-10
				Chromium	22.09	mg/kg	3.E-08
				Cobalt	8.47	mg/kg	3.E-09
				Copper	44.95	mg/kg	--
				Iron	20993	mg/kg	--
				Manganese	472.7	mg/kg	--
				Vanadium	34.92	mg/kg	--
				Heptachlor epoxide	0.0629	mg/kg	2.E-11
				Aroclor 1254	0.48	mg/kg	3.E-11
				Aroclor 1260	0.51	mg/kg	3.E-11
				Di-n-octylphthalate	0.64	mg/kg	--
				Dimethylphthalate	0.308	mg/kg	--
				Benzo(a)pyrene*	0.0173	mg/kg	8.E-12
				2,4,6-Trinitrotoluene	61.1	mg/kg	--
				2,4-Dinitrotoluene	13.78	mg/kg	--
				Dinitrotoluene Mix	13.88	mg/kg	--
				Aminodinitrotoluenes	27.44	mg/kg	--
				RDX	0.77	mg/kg	--
				Nitroglycerin	32.5	mg/kg	--
				2,3,7,8-TCDD Equivalents	0.0000604	mg/kg	3.E-10
			Exp. Route Total				3.E-08
		Exposure Point Total					3.E-08
	Exposure Medium Total						3.E-08
Soil Total							5.E-05
Groundwater	Groundwater	Groundwater used for Tap Water	Ingestion	Manganese	72.1	ug/L	--
			Exp. Route Total				--
			Dermal Abs.	Manganese	72.1	ug/L	--
			Exp. Route Total				--
		Exposure Point Total					--
	Exposure Medium Total						--
Groundwater Total							--
							5.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.2-9.1.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Maintenance Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	3.E-03	--	1.E-04	3.E-03
			Arsenic	2.E-07	--	2.E-08	2.E-07	Arsenic	skin/ vascular	1.E-03	--	1.E-04	1.E-03
			Chromium	--	--	--	--	Chromium	NOAEL	2.E-03	--	2.E-03	4.E-03
			Cobalt	--	--	--	--	Cobalt	blood	9.E-05	--	3.E-06	1.E-04
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	6.E-03	--	2.E-04	7.E-03
			Manganese	--	--	--	--	Manganese	CNS	6.E-03	--	5.E-03	1.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	8.E-03	--	1.E-02	2.E-02
			Aroclor 1254	1.E-07	--	6.E-08	2.E-07	Aroclor 1254	eyes	8.E-03	--	4.E-03	1.E-02
			Aroclor 1260	5.E-08	--	2.E-08	7.E-08	Aroclor 1260	NA	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	NA	3.E-08	--	9.E-09	3.E-08
			Benzo(a)pyrene	9.E-09	--	4.E-09	1.E-08	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	4.E-08	--	4.E-09	5.E-08	2,4,6-Trinitrotoluene	liver	8.E-03	--	8.E-04	9.E-03
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	9.E-04	--	3.E-04	1.E-03
			Dinitrotoluene Mix	5.E-07	--	2.E-07	6.E-07	Dinitrotoluene Mix	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	8.E-04	--	2.E-05	8.E-04
			RDX	1.E-08	--	2.E-10	1.E-08	RDX	prostate	1.E-04	--	5.E-06	1.E-04
			Nitroglycerin	5.E-07	--	2.E-08	5.E-07	Nitroglycerin	vascular	8.E-01	--	3.E-02	8.E-01
			2,3,7,8-TCDD Equivalents	2.E-06	--	2.E-07	2.E-06	2,3,7,8-TCDD Equivalents	--	--	--	--	--
			Total	3.3.E-06	--	5.E-07	4.E-06	Total		8.E-01	--	5.E-02	9.E-01
		Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	3.E-04	--	3.E-04
			Arsenic	--	2.E-10	--	2.E-10	Arsenic	NA	--	--	--	--
			Chromium	--	7.E-09	--	7.E-09	Chromium	respiratory	--	1.E-05	--	1.E-05
			Cobalt	--	6.E-10	--	6.E-10	Cobalt	respiratory	--	3.E-05	--	3.E-05
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	8.E-04	--	8.E-04
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Aroclor 1254	--	1.E-11	--	1.E-11	Aroclor 1254	NA	--	--	--	--
			Aroclor 1260	--	5.E-12	--	5.E-12	Aroclor 1260	NA	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	NA	--	--	--	--
			Benzo(a)pyrene	--	3.E-13	--	3.E-13	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	--	--	--	--
			RDX	--	--	--	--	RDX	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	2.E-10	--	2.E-10	2,3,7,8-TCDD Equivalents	--	--	--	--	--
			Total	--	8.E-09	--	8.E-09	Total		--	1.E-03	--	1.E-03
						Total Risk Across Soil	4.E-06					Total Hazard Index Across Soil	9.E-01

Total Risk Across All Media and All Exposure Routes	4.E-06
Total Hazard Index Across All Media and All Exposure Routes	9.E-01

Total blood HI across all media =	8.E-03
Total CNS HI across all media =	2.E-02
Total skin HI across all media =	1.E-03
Total respiratory HI across all media =	4.E-05
Total GI tract HI across all media =	7.E-03
Total kidney HI across all media =	2.E-02
Total liver HI across all media =	2.E-02
Total vascular HI across all media =	8.E-01
Total eyes HI across all media =	1.E-02

TABLE E.2-9.2.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Commercial Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	7.E-03	--	4.E-04	7.E-03
			Antimony	--	--	--	--	Antimony	blood	3.E-03	--	1.E-03	5.E-03
			Arsenic	4.E-07	--	9.E-08	5.E-07	Arsenic	skin/ vascular	3.E-03	--	5.E-04	3.E-03
			Chromium	--	--	--	--	Chromium	NOAEL	4.E-03	--	1.E-02	1.E-02
			Cobalt	--	--	--	--	Cobalt	blood	2.E-04	--	1.E-05	2.E-04
			Copper	--	--	--	--	Copper	GI tract	5.E-04	--	4.E-05	6.E-04
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	1.E-02	--	1.E-03	2.E-02
			Manganese	--	--	--	--	Manganese	CNS	1.E-02	--	2.E-02	3.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	2.E-02	--	4.E-02	6.E-02
			Heptachlor epoxide	1.E-07	--	7.E-08	2.E-07	Heptachlor epoxide	liver	2.E-03	--	2.E-03	4.E-03
			Aroclor 1254	2.E-07	--	2.E-07	3.E-07	Aroclor 1254	eyes	1.E-02	--	1.E-02	2.E-02
			Aroclor 1260	2.E-07	--	2.E-07	3.E-07	Aroclor 1260	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	8.E-06	--	5.E-06	1.E-05
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	NA	2.E-08	--	1.E-08	3.E-08
			Benzo(a)pyrene	2.E-08	--	2.E-08	4.E-08	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	3.E-07	--	6.E-08	4.E-07	2,4,6-Trinitrotoluene	liver	6.E-02	--	1.E-02	7.E-02
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	3.E-03	--	2.E-03	6.E-03
			Dinitrotoluene Mix	2.E-06	--	1.E-06	3.E-06	Dinitrotoluene Mix	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	7.E-03	--	3.E-04	7.E-03
			RDX	1.E-08	--	4.E-10	2.E-08	RDX	prostate	1.E-04	--	1.E-05	1.E-04
			Nitroglycerin	1.E-07	--	6.E-09	1.E-07	Nitroglycerin	vascular	2.E-01	--	1.E-02	2.E-01
			2,3,7,8-TCDD Equivalents	2.E-06	--	3.E-07	2.E-06	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	5.E-06	--	2.E-06	7.E-06	Total		3.E-01	--	1.E-01	4.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	2.E-03	--	2.E-03
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	1.E-09	--	1.E-09	Arsenic	NA	--	--	--	--
			Chromium	--	4.E-08	--	4.E-08	Chromium	respiratory	--	9.E-05	--	9.E-05
			Cobalt	--	3.E-09	--	3.E-09	Cobalt	respiratory	--	2.E-04	--	2.E-04
			Copper	--	--	--	--	Copper	NA	--	--	--	--
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	4.E-03	--	4.E-03
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Heptachlor epoxide	--	2.E-11	--	2.E-11	Heptachlor epoxide	NA	--	--	--	--
			Aroclor 1254	--	4.E-11	--	4.E-11	Aroclor 1254	NA	--	--	--	--
			Aroclor 1260	--	4.E-11	--	4.E-11	Aroclor 1260	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	NA	--	--	--	--
			Benzo(a)pyrene	--	2.E-12	--	2.E-12	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	--	--	--	--
			RDX	--	--	--	--	RDX	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	4.E-10	--	4.E-10	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	--	4.E-08	--	4.E-08	Total		--	6.E-03	--	6.E-03

TABLE E.2-9.2.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Commercial Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Manganese	--	--	--	--	Manganese	CNS	4.E-02	--	7.E-04	4.E-02
			Total	--	--	--	--	Total		4.E-02	--	7.E-04	4.E-02
							Total Risk Across Soil						Total Hazard Index Across Soil
							Total Risk Across Groundwater						Total Hazard Index Across Groundwater
							Total Risk Across All Media and All Exposure Routes						Total Hazard Index Across All Media and All Exposure Routes

Total Risk Across Soil	7.E-06
Total Risk Across Groundwater	--
Total Risk Across All Media and All Exposure Routes	7.E-06

Total Hazard Index Across Soil	4.E-01
Total Hazard Index Across Groundwater	4.E-02
Total Hazard Index Across All Media and All Exposure Routes	5.E-01

Total blood HI across all media =	3.E-02
Total CNS HI across all media =	8.E-02
Total skin HI across all media =	3.E-03
Total respiratory HI across all media =	3.E-04
Total GI tract HI across all media =	2.E-02
Total kidney HI across all media =	6.E-02
Total liver HI across all media =	1.E-01
Total vascular HI across all media =	2.E-01
Total eyes HI across all media =	2.E-02
Total prostate HI across all media =	1.E-04
Total thyroid HI across all media =	1.E-05

TABLE E.2-9.3.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Construction Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	–	--	--	–	Aluminum	developmental CNS	4.E-02	--	1.E-03	5.E-02
			Antimony	–	--	--	–	Antimony	blood	4.E-02	--	8.E-03	5.E-02
			Arsenic	1.E-07	--	1.E-08	1.E-07	Arsenic	skin/ vascular	2.E-02	--	2.E-03	2.E-02
			Chromium	–	--	--	–	Chromium	NOAEL	4.E-03	--	4.E-03	8.E-03
			Cobalt	–	--	--	–	Cobalt	blood	1.E-03	--	4.E-05	1.E-03
			Copper	–	--	--	–	Copper	GI tract	4.E-03	--	1.E-04	4.E-03
			Iron	–	--	--	–	Iron	blood/ liver/ GI tract	1.E-01	--	3.E-03	1.E-01
			Manganese	–	--	--	–	Manganese	CNS	8.E-02	--	6.E-02	1.E-01
			Vanadium	–	--	--	–	Vanadium	kidney	2.E-02	--	2.E-02	3.E-02
			Heptachlor epoxide	3.E-08	--	8.E-09	3.E-08	Heptachlor epoxide	liver	2.E-02	--	5.E-03	2.E-02
			Aroclor 1254	4.E-08	--	1.9.E-08	6.E-08	Aroclor 1254	eyes	3.E-02	--	1.E-02	4.E-02
			Aroclor 1260	5.E-08	--	2.E-08	7.E-08	Aroclor 1260	NA	--	--	–	–
			Di-n-octylphthalate	–	--	--	–	Di-n-octylphthalate	liver/thyroid	5.E-06	--	2.E-06	7.E-06
			Dimethylphthalate	–	--	--	–	Dimethylphthalate	NA	1.E-07	--	3.E-08	1.E-07
			Benzo(a)pyrene	6.E-09	--	2.E-09	8.E-09	Benzo(a)pyrene	NA	--	--	–	–
			2,4,6-Trinitrotoluene	8.E-08	--	8.E-09	9.E-08	2,4,6-Trinitrotoluene	liver	4.E-01	--	4.E-02	4.E-01
			2,4-Dinitrotoluene	–	--	--	–	2,4-Dinitrotoluene	CNS/ blood/ liver	2.E-02	--	7.E-03	3.E-02
			Dinitrotoluene Mix	4.E-07	--	1.E-07	6.E-07	Dinitrotoluene Mix	NA	--	--	–	–
			Aminodinitrotoluenes	–	--	--	–	Aminodinitrotoluenes	NA	4.E-02	--	8.E-04	5.E-02
			RDX	4.E-09	--	5.E-11	4.E-09	RDX	prostate	8.E-04	--	4.E-05	9.E-04
			Nitroglycerin	3.E-08	--	8.E-10	3.E-08	Nitroglycerin	vascular	1.E+00	--	3.E-02	1.E+00
			2,3,7,8-TCDD Equivalents	4.E-07	--	3.8.E-08	5.E-07	2,3,7,8-TCDD Equivalents	NA	--	--	–	–
			Total	1.E-06	--	2.E-07	1.4.E-06	Total		1.9.E+00	--	2.E-01	2.E+00
	Air	Air (Fugitive Dust)	Aluminum	–	--	--	–	Aluminum	CNS	--	2.E+00	–	2.E+00
			Antimony	–	--	--	–	Antimony	NA	--	4.E-03	–	4.E-03
			Arsenic	–	6.E-08	--	6.E-08	Arsenic	NA	--	--	–	--
			Chromium	–	2.E-06	--	2.E-06	Chromium	respiratory	--	1.E-01	–	1.E-01
			Cobalt	–	2.E-07	--	2.E-07	Cobalt	respiratory	--	2.E-01	–	2.E-01
			Copper	–	--	--	–	Copper	NA	--	--	–	--
			Iron	–	--	--	–	Iron	NA	--	--	–	--
			Manganese	–	--	--	–	Manganese	CNS	--	6.E+00	–	6.E+00
			Vanadium	–	--	--	–	Vanadium	NA	--	--	–	–
			Heptachlor epoxide	–	1.E-09	--	1.E-09	Heptachlor epoxide	NA	--	--	–	–
			Aroclor 1254	–	2.E-09	--	2.E-09	Aroclor 1254	NA	--	--	–	–
			Aroclor 1260	–	2.E-09	--	2.E-09	Aroclor 1260	NA	--	--	–	–
			Di-n-octylphthalate	–	--	--	–	Di-n-octylphthalate	NA	--	--	–	–
			Dimethylphthalate	–	--	--	–	Dimethylphthalate	NA	--	--	–	–
			Benzo(a)pyrene	–	1.E-10	--	1.E-10	Benzo(a)pyrene	NA	--	--	–	–
			2,4,6-Trinitrotoluene	–	--	--	–	2,4,6-Trinitrotoluene	NA	--	--	–	–
			2,4-Dinitrotoluene	–	--	--	–	2,4-Dinitrotoluene	NA	--	--	–	–
			Dinitrotoluene Mix	–	--	--	–	Dinitrotoluene Mix	NA	--	--	–	–
			Aminodinitrotoluenes	–	--	--	–	Aminodinitrotoluenes	NA	--	--	–	–
			RDX	–	--	--	–	RDX	NA	--	--	–	--
			Nitroglycerin	–	--	--	–	Nitroglycerin	NA	--	--	–	–
			2,3,7,8-TCDD Equivalents	–	2.E-08	--	2.E-08	2,3,7,8-TCDD Equivalents	NA	--	--	–	–
			Total	–	2.E-06	--	2.5.E-06	Total		--	8.E+00	–	8.E+00

TABLE E.2-9.3.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Construction Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Manganese	--	--	--	--	Manganese	CNS	4.E-04	--	6.E-03	6.E-03
				--	--	--	--			4.E-04	--	6.E-03	6.E-03
							Total Risk Across Soil	4.E-06					Total Hazard Index Across Soil 1.E+01
							Total Risk Across Groundwater	--					Total Hazard Index Across Groundwater 6.E-03
							Total Risk Across All Media and All Exposure Routes	4.E-06					Total Hazard Index Across All Media and All Exposure Routes 1.E+01

Total blood HI across all media =	2.E-01
Total CNS HI across all media =	8.E+00
Total skin HI across all media =	2.E-02
Total respiratory HI across all media =	4.E-01
Total GI tract HI across all media =	1.E-01
Total kidney HI across all media =	3.E-02
Total liver HI across all media =	6.E-01
Total vascular HI across all media =	1.E+00
Total eyes HI across all media =	4.E-02
Total prostate HI across all media =	9.E-04
Total thyroid HI across all media =	7.E-06

TABLE E.2-9.4.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adult Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	–	--	--	–	Aluminum	developmental CNS	2.E-02	--	8.E-04	2.E-02
			Antimony	–	--	–	–	Antimony	blood	9.E-03	--	2.E-03	1.E-02
			Arsenic	1.E-06	--	1.E-07	1.E-06	Arsenic	skin/ vascular	8.E-03	--	9.E-04	9.E-03
			Chromium	–	--	–	–	Chromium	NOAEL	1.E-02	--	2.E-02	3.E-02
			Cobalt	–	--	–	–	Cobalt	blood	6.E-04	--	2.E-05	6.E-04
			Copper	–	--	–	–	Copper	GI tract	2.E-03	--	6.E-05	2.E-03
			Iron	–	--	–	–	Iron	blood/ liver/ GI tract	4.E-02	--	2.E-03	4.E-02
			Manganese	–	--	–	–	Manganese	CNS	3.E-02	--	3.E-02	6.E-02
			Vanadium	–	--	–	–	Vanadium	kidney	5.E-02	--	7.E-02	1.E-01
			Heptachlor epoxide	3.E-07	--	1.E-07	4.E-07	Heptachlor epoxide	liver	7.E-03	--	3.E-03	9.E-03
			Aroclor 1254	5.E-07	--	3.E-07	7.E-07	Aroclor 1254	eyes	3.E-02	--	2.E-02	5.E-02
			Aroclor 1260	5.E-07	--	3.E-07	7.E-07	Aroclor 1260	NA	--	--	–	--
			Di-n-octylphthalate	–	--	--	–	Di-n-octylphthalate	liver/thyroid	2.E-05	--	9.E-06	3.E-05
			Dimethylphthalate	–	--	--	–	Dimethylphthalate	NA	4.E-08	--	2.E-08	6.E-08
			Benzo(a)pyrene*	1.E-07	--	6.E-08	2.E-07	Benzo(a)pyrene	NA	--	--	–	--
			2,4,6-Trinitrotoluene	9.E-07	--	1.E-07	1.E-06	2,4,6-Trinitrotoluene	liver	2.E-01	--	2.E-02	2.E-01
			2,4-Dinitrotoluene	–	--	--	–	2,4-Dinitrotoluene	CNS/ blood/ liver	9.E-03	--	4.E-03	1.E-02
			Dinitrotoluene Mix	4.E-06	--	2.E-06	6.E-06	Dinitrotoluene Mix	NA	--	--	–	--
			Aminodinitrotoluenes	–	--	--	–	Aminodinitrotoluenes	NA	2.E-02	--	4.E-04	2.E-02
			RDX	4.E-08	--	6.E-10	4.E-08	RDX	prostate	4.E-04	--	2.E-05	4.E-04
			Nitroglycerin	3.E-07	--	1.E-08	3.E-07	Nitroglycerin	vascular	4.E-01	--	2.E-02	5.E-01
			2,3,7,8-TCDD Equivalents	4.E-06	--	5.E-07	5.E-06	2,3,7,8-TCDD Equivalents	NA	--	--	–	--
			Total	1.E-05	--	3.E-06	2.E-05	Total		8.E-01	--	2.E-01	1.E+00
	Air	Air (Fugitive Dust)	Aluminum	–	--	–	–	Aluminum	CNS	--	4.E-04	–	4.E-04
			Antimony	–	--	–	–	Antimony	NA	--	--	–	--
			Arsenic	–	2.E-10	–	2.E-10	Arsenic	NA	--	--	–	--
			Chromium	–	8.E-09	–	8.E-09	Chromium	respiratory	--	2.E-05	–	2.E-05
			Cobalt	–	7.E-10	–	7.E-10	Cobalt	respiratory	--	4.E-05	–	4.E-05
			Copper	–	--	–	–	Copper	NA	--	--	–	--
			Iron	–	--	–	–	Iron	NA	--	--	–	--
			Manganese	–	--	–	–	Manganese	CNS	--	9.E-04	–	9.E-04
			Vanadium	–	--	–	–	Vanadium	NA	--	--	–	--
			Heptachlor epoxide	–	5.E-12	--	5.E-12	Heptachlor epoxide	NA	--	--	–	--
			Aroclor 1254	–	8.E-12	–	8.E-12	Aroclor 1254	NA	--	--	–	--
			Aroclor 1260	–	9.E-12	–	9.E-12	Aroclor 1260	NA	--	--	–	--
			Di-n-octylphthalate	–	--	--	–	Di-n-octylphthalate	NA	--	--	–	--
			Dimethylphthalate	–	--	--	–	Dimethylphthalate	NA	--	--	–	--
			Benzo(a)pyrene*	–	9.E-13	--	9.E-13	Benzo(a)pyrene	NA	--	--	–	--
			2,4,6-Trinitrotoluene	–	--	–	–	2,4,6-Trinitrotoluene	NA	--	--	–	--
			2,4-Dinitrotoluene	–	--	--	–	2,4-Dinitrotoluene	NA	--	--	–	--
			Dinitrotoluene Mix	–	--	--	–	Dinitrotoluene Mix	NA	--	--	–	--
			Aminodinitrotoluenes	–	--	--	–	Aminodinitrotoluenes	NA	--	--	–	--
			RDX	–	--	–	–	RDX	NA	--	--	–	--
			Nitroglycerin	–	--	–	–	Nitroglycerin	NA	--	--	–	--
			2,3,7,8-TCDD Equivalents	–	8.E-11	--	8.E-11	2,3,7,8-TCDD Equivalents	NA	--	--	–	--
			Total	–	9.E-09	–	9.E-09	Total		--	1.E-03	–	1.E-03

TABLE E.2-9.4.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adult Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Manganese	--	--	--	--	Manganese	CNS	1.E-01	--	1.E-02	1.E-01
			Total	--	--	--	--	Total		1.E-01	--	1.E-02	1.E-01
							Total Risk Across Soil	2.E-05					Total Hazard Index Across Soil	1.E+00
							Total Risk Across Groundwater	--					Total Hazard Index Across Groundwater	1.E-01
							Total Risk Across All Media and All Exposure Routes	2.E-05					Total Hazard Index Across All Media and All Exposure Routes	1.E+00

Total blood HI across all media =	7.E-02
Total CNS HI across all media =	2.E-01
Total skin HI across all media =	9.E-03
Total respiratory HI across all media =	6.E-05
Total GI tract HI across all media =	4.E-02
Total kidney HI across all media =	1.E-01
Total liver HI across all media =	3.E-01
Total vascular HI across all media =	5.E-01
Total eyes HI across all media =	5.E-02
Total prostate HI across all media =	4.E-04
Total thyroid HI across all media =	3.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.2-9.5.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Child Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	2.E-01	--	5.E-03	2.E-01
			Antimony	--	--	--	--	Antimony	blood	8.E-02	--	2.E-02	1.E-01
			Arsenic	3.E-06	--	2.E-07	3.E-06	Arsenic	skin/ vascular	7.E-02	--	6.E-03	8.E-02
			Chromium	--	--	--	--	Chromium	NOAEL	9.E-02	--	1.E-01	2.E-01
			Cobalt	--	--	--	--	Cobalt	blood	5.E-03	--	2.E-04	6.E-03
			Copper	--	--	--	--	Copper	GI tract	1.E-02	--	4.E-04	1.E-02
			Iron	--	--	--	--	Iron	blood/ liver/ GI tract	4.E-01	--	1.E-02	4.E-01
			Manganese	--	--	--	--	Manganese	CNS	3.E-01	--	2.E-01	5.E-01
			Vanadium	--	--	--	--	Vanadium	kidney	4.E-01	--	5.E-01	9.E-01
			Heptachlor epoxide	6.E-07	--	2.E-07	8.E-07	Heptachlor epoxide	liver	6.E-02	--	2.E-02	8.E-02
			Aroclor 1254	1.E-06	--	4.E-07	1.E-06	Aroclor 1254	eyes	3.E-01	--	1.E-01	4.E-01
			Aroclor 1260	1.E-06	--	4.E-07	2.E-06	Aroclor 1260	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	2.E-04	--	6.E-05	3.E-04
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	NA	4.E-07	--	1.E-07	5.E-07
			Benzo(a)pyrene*	7.E-07	--	3.E-07	1.E-06	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	2.E-06	--	2.E-07	2.E-06	2,4,6-Trinitrotoluene	liver	2.E+00	--	1.E-01	2.E+00
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	9.E-02	--	2.E-02	1.E-01
			Dinitrotoluene Mix	1.E-05	--	3.E-06	1.E-05	Dinitrotoluene Mix	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	2.E-01	--	3.E-03	2.E-01
			RDX	9.E-08	--	1.E-09	9.E-08	RDX	prostate	3.E-03	--	1.E-04	3.E-03
			Nitroglycerin	6.E-07	--	2.E-08	6.E-07	Nitroglycerin	vascular	4.E+00	--	1.E-01	4.E+00
			2,3,7,8-TCDD Equivalents	1.E-05	--	8.E-07	1.E-05	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	3.E-05	--	5.E-06	3.E-05	Total		8.E+00	--	1.E+00	9.E+00
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	4.E-03	--	4.E-03
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	6.E-10	--	6.E-10	Arsenic	NA	--	--	--	--
			Chromium	--	2.3.E-08	--	2.3.E-08	Chromium	respiratory	--	2.E-04	--	2.E-04
			Cobalt	--	2.E-09	--	2.E-09	Cobalt	respiratory	--	4.E-04	--	4.E-04
			Copper	--	--	--	--	Copper	NA	--	--	--	--
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	1.E-02	--	1.E-02
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Heptachlor epoxide	--	1.E-11	--	1.E-11	Heptachlor epoxide	NA	--	--	--	--
			Aroclor 1254	--	2.E-11	--	2.E-11	Aroclor 1254	NA	--	--	--	--
			Aroclor 1260	--	3.E-11	--	3.E-11	Aroclor 1260	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Dimethylphthalate	--	--	--	--	Dimethylphthalate	NA	--	--	--	--
			Benzo(a)pyrene*	--	7.E-12	--	7.E-12	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	--	--	--	--
			RDX	--	--	--	--	RDX	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	2.E-10	--	2.E-10	2,3,7,8-TCDD Equivalents	NA	--	--	--	--
			Total	--	3.E-08	--	3.E-08			--	1.E-02	--	1.E-02

TABLE E.2-9.5.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Child Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Manganese	--	--	--	--	Manganese	CNS	2.3.E-01	--	4.E-02	3.E-01
				--	--	--	--			2.3.E-01	--	4.E-02	3.E-01
							Total Risk Across Soil						Total Hazard Index Across Soil	9.E+00
							Total Risk Across Groundwater						Total Hazard Index Across Groundwater	3.E-01
							Total Risk Across All Media and All Exposure Routes	3E-05					Total Hazard Index Across All Media and All Exposure Routes	9.E+00

Total blood HI across all media =	6.E-01
Total CNS HI across all media =	1.E+00
Total skin HI across all media =	8.E-02
Total respiratory HI across all media =	6.E-04
Total GI tract HI across all media =	4.E-01
Total kidney HI across all media =	9.E-01
Total liver HI across all media =	2.E+00
Total vascular HI across all media =	4.E+00
Total eyes HI across all media =	4.E-01
Total prostate HI across all media =	3.E-03
Total thyroid HI across all media =	3.E-04

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.2-9.6.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Lifetime Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--
			Antimony	--	--	--	--
			Arsenic	4.E-06	--	4.E-07	4.E-06
			Chromium	--	--	--	--
			Cobalt	--	--	--	--
			Copper	--	--	--	--
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Vanadium	--	--	--	--
			Heptachlor epoxide	9.E-07	--	3.E-07	1.E-06
			Aroclor 1254	2.E-06	--	7.E-07	2.E-06
			Aroclor 1260	2.E-06	--	7.E-07	2.E-06
			Di-n-octylphthalate	--	--	--	--
			Dimethylphthalate	--	--	--	--
			Benzo(a)pyrene*	8.E-07	--	3.E-07	1.E-06
			2,4,6-Trinitrotoluene	3.E-06	--	3.E-07	3.E-06
			2,4-Dinitrotoluene	--	--	--	--
			Dinitrotoluene Mix	1.E-05	--	5.E-06	2.E-05
			Aminodinitrotoluenes	--	--	--	--
			RDX	1.E-07	--	2.E-09	1.E-07
			Nitroglycerin	9.E-07	--	3.E-08	9.E-07
			2,3,7,8-TCDD Equivalents	1.E-05	--	1.E-06	2.E-05
			Total	4.E-05	--	9.E-06	5.E-05
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--
			Antimony	--	--	--	--
			Arsenic	--	8.E-10	--	8.E-10
			Chromium	--	3.E-08	--	3.1.E-08
			Cobalt	--	3.E-09	--	3.E-09
			Copper	--	--	--	--
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Vanadium	--	--	--	--
			Heptachlor epoxide	--	2.E-11	--	2.E-11
			Aroclor 1254	--	3.E-11	--	3.E-11
			Aroclor 1260	--	3.E-11	--	3.E-11
			Di-n-octylphthalate	--	--	--	--
			Dimethylphthalate	--	--	--	--
			Benzo(a)pyrene*	--	8.E-12	--	8.E-12
			2,4,6-Trinitrotoluene	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--
			RDX	--	--	--	--
			Nitroglycerin	--	--	--	--
			2,3,7,8-TCDD Equivalents	--	3.E-10	--	3.E-10
			Total	--	3.E-08	--	3.E-08
Groundwater	Groundwater	Groundwater used as tapwater	Manganese	--	--	--	--
				--	--	--	--
						Total Risk Across Soil	5.0.E-05
						Total Risk Across Groundwater	--

Total Risk Across All Media and All Exposure Routes: 5.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated accordance with USEPA Region III ADAF Guidance (11/08/2006).

TABLE E.2-10.1.RME
RME Risk Assessment Summary: Construction Worker- Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	None Identified	--	--	--	--	None Identified					
			Total	--	--	--	--	Total		--	--	--	--
	Air	Air	Aluminum	--	--	--	--	Aluminum	CNS	--	2.3.E+00	--	2.E+00
			Manganese	--	--	--	--	Manganese	CNS	--	5.6.E+00	--	6.E+00
			Total	--	--	--	--	Total		--	8.E+00	--	8.E+00
Groundwater	Groundwater	Groundwater	None Identified					None Identified					
				--	--	--	--			--	--	--	--
							Total Risk Across Soil						Total Hazard Index Across Soil
							--						8.E+00

Total Risk Across All Media and All Exposure Routes: --

Total Hazard Index Across All Media and All Exposure Routes: 8.E+00

Total CNS HI across all media = 8.E+00

TABLE E.2-10.2.RME
RME Risk Assessment Summary: Child Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Non-Carcinogenic Hazard Quotient				
				Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Iron	blood/ liver/ GI tract	4.E-01	--	1.E-02	4.E-01
			2,4,6-Trinitrotoluene	liver	2.E+00	--	1.E-01	2.E+00
			Nitroglycerin	vascular	4.E+00	--	1.E-01	4.E+00
			Total		4.E+00	--	1.E-01	6.E+00
	Air	Air (Fugitive Dust)	None Identified					
			Total		--	--	--	--
Groundwater	Groundwater	Groundwater used as tapwater	None Identified					
					--	--	--	--

Total Hazard Index Across Soil	6.E+00
Total Hazard Index Across Groundwater	--

Total Hazard Index Across All Media and All Exposure Routes	6.E+00

Total liver HI across all media =	2.E+00
Total vascular HI across all media =	4.E+00

IRON MARGIN OF EXPOSURE EVALUATION

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Table 1
Iron "Margin of Exposure" Evaluation
SMWU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Total Soil - Child Resident - SWMU 54 Area A				
Iron EPC (mg/kg)	Child Daily Intake Estimate* (mg/day)	RDA for Child 6 mths to 4 years Old	Child Daily Intake ** (mg/kg-day)	Provisional RfD (mg/kg-day)
19,503	3.7	10 mg/day	0.25	0.7
Total Soil - Child Resident - SWMU 54 Area B				
Iron EPC (mg/kg)	Child Daily Intake Estimate* (mg/day)	RDA for Child 6 mths to 4 years Old	Child Daily Intake ** (mg/kg-day)	Provisional RfD (mg/kg-day)
20,993	4.0	10 mg/day	0.27	0.7

* See Table H-2 for equations used to calculated daily intake estimates.
** Default weight of 15 kg used for child

Table 2
Iron "Margin of Exposure" Evaluation
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation
Ingestion-Total Soil	Resident	Child	SWMU 40/71	AT-NC	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991a	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	Chronic
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	MDC or EPC	Daily = $\frac{CS*IRS*EF*ED*FI*CF1}{BW*AT}$
				ED	Exposure Duration	6	years	USEPA, 1991a	Intake
				EF	Exposure Frequency	350	days/year	USEPA, 1991a	(mg/day)
				FI	Fraction Ingested	1	(unitless)		
				IRS	Ingestion Rate of Soil	200	mg/day	USEPA, 1991a	

LEAD IEUBK MODEL RESULTS

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LEAD MODEL FOR WINDOWS Version 1.0

==========
Model Version: 1.0 Build 263
User Name: Tina Devine
Date: 06/11/2007
Site Name: RFAAP
Operable Unit: SWMU 54 - Area B
Run Mode: Site Risk Assessment

Soil/Dust Data
SWMU 54 - Area B Total Soil EPC
Water Data
SWMU 54 - Area B Maximum Detected Conc. GW
==========
The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.600 ug Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 1097.800 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000

Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	1554.000	1097.800
1-2	1554.000	1097.800
2-3	1554.000	1097.800
3-4	1554.000	1097.800
4-5	1554.000	1097.800
5-6	1554.000	1097.800
6-7	1554.000	1097.800

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

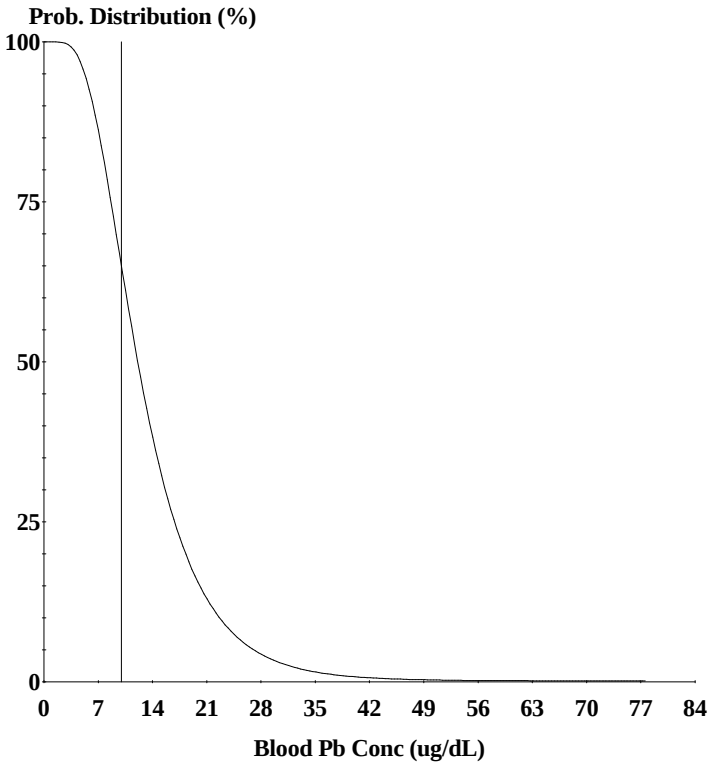
****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 2.500 ug Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.022	0.000	0.117
1-2	0.034	2.019	0.000	0.279
2-3	0.062	2.360	0.000	0.303
3-4	0.067	2.356	0.000	0.320
4-5	0.067	2.468	0.000	0.361
5-6	0.093	2.690	0.000	0.394
6-7	0.093	3.023	0.000	0.408

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	24.301	26.461	13.7
1-2	36.868	39.200	15.7
2-3	38.376	41.100	14.9
3-4	39.845	42.588	14.4
4-5	32.100	34.996	12.2
5-6	29.860	33.037	10.4
6-7	28.704	32.228	9.2



Cutoff = 10.000 ug/dl
Geo Mean = 12.690
GSD = 1.600
% Above = 69.387

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment

Table 1
Calculation of Blood Lead Concentrations using ALM - Construction Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1 GSDi = Hom	Using Equation 1 GSDi = Het	Using Equation 2 GSDi = Hom	Using Equation 2 GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	251	251	251	251
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.330	0.330	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.330	0.330
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	250	250	250	250
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**4.2**	**4.4**	**4.2**	**4.4**
$PbB_{fetal, 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**12.9**	**15.7**	**12.9**	**15.7**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**9.6%**	**13.4%**	**9.6%**	**13.4%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 2
Calculation of Blood Lead Concentrations using ALM - Commercial Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario: Using Equation 1 GSDi = Hom	Using Equation 1 GSDi = Het	Using Equation 2 GSDi = Hom	Using Equation 2 GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	251	251	251	251
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.050	0.050
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	250	250	250	250
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**1.9**	**2.1**	**1.9**	**2.1**
$PbB_{fetal, 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**5.8**	**7.5**	**5.8**	**7.5**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**0.9%**	**2.3%**	**0.9%**	**2.3%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 3
Calculation of Blood Lead Concentrations using ALM - Maintenance Worker - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/03

Exposure Variable	PbB Equation[1] 1*	PbB Equation[1] 2**	Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
					Using Equation 1		Using Equation 2	
					GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	366	366	366	366
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB_0	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	--	--
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.100	0.100
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	1.0	1.0
K_{SD}		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
$AF_{S, D}$	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
$EF_{S, D}$	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
$AT_{S, D}$	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**			**ug/dL**	**2.6**	**2.8**	**2.6**	**2.8**
$PbB_{fetal, 0.95}$	**95th percentile PbB among fetuses of adult workers**			**ug/dL**	**7.8**	**9.8**	**7.8**	**9.8**
PbB_t	**Target PbB level of concern (e.g., 10 ug/dL)**			**ug/dL**	**10.0**	**10.0**	**10.0**	**10.0**
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**			**%**	**2.4%**	**4.7%**	**2.4%**	**4.7%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

***Equation 1, based on Eq. 1, 2 in USEPA (1996).**

PbB_{adult} =	$(PbS*BKSF*IR_{S+D}*AF_{S,D}*EF_S/AT_{S,D}) + PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

****Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

PbB_{adult} =	$PbS*BKSF*([(IR_{S+D})*AF_S*EF_S*W_S]+[K_{SD}*(IR_{S+D})*(1-W_S)*AF_D*EF_D])/365+PbB_0$
$PbB_{fetal, 0.95}$ =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

APPENDIX F

ECOLOGICAL RISK ASSESSMENT

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APPENDIX F.1

SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT PROCESS

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APPENDIX F.1
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT PROCESS
SWMU 54 RFI/CMS REPORT

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LIST OF ABBREVIATIONS AND ACRONYMS

% ..... Percent
ADD..... Average Daily Dose
AF ..... Area Use Factor
BAF..... Bioaccumulation Factor
BTAG..... Biological Technical Assistance Group
BW ..... Body Weight
C_{TRV}..... NOAEL- or LOAEL-based TRV concentration
COPC ..... Chemical of Potential Concern
COPEC..... Chemical of Potential Ecological Concern
DF ..... Dietary Fraction
DW:WW ..... Dry weight to wet weight
ECO-SSL ..... Ecological Soil Screening Level
EF..... Extrapolation Factor
EPC ..... Exposure Point Concentration
HQ..... Hazard Quotient
IR ..... Ingestion Rate
kg ..... Kilogram
LD_{50}..... Lethal Dose to 50% of the test population
LOAEL ..... Lowest Observable Adverse Effects Level
MDC ..... Maximum Detected Concentration
mg ..... Milligram
mg/kg ..... Milligrams Per Kilogram
NOAEL..... No Observable Adverse Effects Level
ORNL..... Oak Ridge National Laboratory
PAH ..... Polynuclear Aromatic Hydrocarbon
SLERA..... Screening Level Ecological Risk Assessment
2,3,7,8 TCDD.... 2,3,7,8-tetrachlorodibenzo-p-dioxin
TEF ..... Toxicity Equivalence Factor
TEQ..... Toxicity Equivalent
TOC ..... Total Organic Carbon
TRV ..... Toxicity Reference Value
UF ..... Uncertainty Factor
UF_{plant} ..... Plant Uptake Factor
USACHPPM..... U.S. Army Center for Health Promotion and Preventive Medicine
USEPA..... U.S. Environmental Protection Agency

1.0 INTRODUCTION

The purpose of this appendix is to present and describe development of exposure assessment models for the receptors presented in Section 7.0, the Screening Level Ecological Risk Assessment (SLERA) at SWMU 54. The following sections provide a summary of parameters used in the models and a detailed description of the direct contact and dose rate modeling approachs used in the SLERA. The complete SLERAs for Area A and Area B are presented in Appendices F.2 and F.3, respectively.

2.0 MODEL PARAMETERS

The direct contact and dose rate models include parameters relating to receptor-specific exposure, chemical of potential concern (COPC) toxicity, and bioaccumulation rates. The following sections describe the estimation of these parameters and major assumptions of parameterization.

2.1 TOXICITY REFERENCE VALUES

MDCs for detected chemicals in soil are used as the preliminary exposure estimate to evaluate a conservative risk scenario for the direct contact pathway to soil invertebrates. Other potentially complete exposure pathways to soil invertebrate and microbial communities include direct ingestion of soil and biota. Due to insufficient information to quantify these pathways, likely secondary to the direct contact/absorption pathway, their omission should not substantially alter the risk characterization.

To evaluate the preliminary exposure estimates, the Toxicity Reference Values (TRVs) that were protective of terrestrial plants and soil invertebrate/microbial communities, were selected from a review of toxicological benchmarks for soil. TRVs for direct contact of soil to invertebrates/microbes and soil to plants were determined from the following guidance:

- USEPA Ecological Soil Screening Level (ECO-SSL): soil invertebrate and plant;
- Oak Ridge National Laboratory (ORNL): plant, microbial community, earthworm values (Efroymson *et al*. 1997a, Efroymson *et al*. 1997b, Efroymson *et al*. 1997c); and
- USEPA Region III Biological Technical Assistance Group (BTAG) soil screening values (USEPA 1995), BTAG freshwater screening benchmarks (USEPA 2006a), and BTAG freshwater sediment screening levels (USEPA 2006b)

Selected screening levels and sources are reported on Tables F.2-5 (Area A) and F.3-5 (Area B) for terrestrial plants and Tables F.2-7 (Area A) and F.3-7 (Area B) for soil invertebrates and microbial communities.

2.2 RECEPTOR-SPECIFIC EXPOSURE PARAMETERS

Wildlife receptors selected to characterize exposure at SWMU 54 include:

- Herbivorous mammals: Meadow Vole (*Microtus pennsylvanicus*);
- Invertivorous mammals: Short-tailed Shrew (*Blarina brevicauda*);
- Invertivorous birds: American Robin (*Turdus migratorius*);
- Carnivorous birds: Red-tailed Hawk (*Buteo jamaicensis*); and
- Carnivorous mammals: Red Fox (*Vulpes vulpes*).

Exposure parameters used to derive TRV-based substrate concentrations for each receptor include body weight (kg), food ingestion rate (kg dry weight/day), dietary fraction, incidental substrate ingestion rate (kg dry weight/day), and area use factor. Both preliminary and refinement level exposure parameters are presented in Table F.2-9 (Area A) and Table F.3-9 (Area B).

2.3 LITERATURE-BASED NOAEL AND LOAEL VALUES

The dose-response relationships for chemicals of potential concern are expressed as NOAELs and LOAELs for wildlife receptors, which are defined as a daily ingested amount (mg/kg body weight-day) that is associated with a specified effect. This process involves the determination of a "test species dose" for a critical endpoint from a particular experimental combination of exposure concentration, exposure duration, test species, and chemical. Endpoints may be based on growth, reproductive, developmental, and survival effects. Such effects are important because they may affect the abundance or reproductive success of receptor populations. The test-species dose from the selected study is then modified using extrapolation and uncertainty factors (EFs and UFs).

For this evaluation, EFs and UFs are used to modify laboratory study results, based on the methodology of Sample et al. (1996). This process involves the determination of a "test species dose" for a critical endpoint from a particular experimental combination of exposure concentration, exposure duration, test species, and chemical. The test-species dose from the selected study is then modified to account for the various extrapolations and uncertainties inherent in applying results from a controlled setting to an ecologically relevant setting, as in:

$$\text{NOAEL or LOAEL} = \frac{\text{Test-Species Dose}}{\text{Duration UF} \times \text{Endpoint UF}} \times \text{Body-Weight EF}$$

EFs and UFs are based on: (1) the duration of exposure, (2) the endpoint measured, and (3) differences in body weights among test and receptor species (Calabrese and Baldwin 1993, Ford et al. 1992, Opresko et al. 1994, Sample et al. 1996, USEPA 1996, Wentsel et al. 1994). EFs and UFs derivation and use is described in the following subsections. The use of surrogate chemical data is also discussed. NOAEL and LOAELs for COPCs are summarized in Table F.2-10 (Area A) and Table F.3-10 (Area B).

2.3.1 The Test-Species Dose

Critical toxicological values are identified from carefully qualified primary and secondary literature references. The selection of particular studies and endpoints used for the derivation of NOAELs and LOAELs is based on the evaluation of the applicable studies and the dose-response data contained therein. In cases where preferred toxicological endpoints are not available, other toxicity values are used, but additional uncertainty factors may be incorporated. All toxicological values chosen for NOAEL and LOAEL derivation are presented on a mg chemical per kg body weight per day (mg/kg BW-day) basis. These units allow comparisons among organisms of different body sizes (Sample et al. 1996).

2.3.2 Duration Uncertainty Factors

Exposure durations of interest include (1) chronic, (2) subchronic, and (3) acute. Chronic studies occur over the lifetime or a majority of the lifespan of the test organism, generally longer than one year for mammals and 10 weeks for birds. Additionally, studies in which the test organism is dosed during a critical life stage (e.g., gestation) are included with chronic duration studies. Subchronic studies include exposures of two weeks to one year in duration that do not occur during a critical life stage. Acute studies typically have exposures of less than two weeks. NOAELs and LOAELs are usually reported from chronic and subchronic studies, with acute studies often reporting LD_{50} levels (LD_{50}; doses corresponding to the overt expression of a serious adverse effect such as mortality in 50% of test animals). Test-species doses from chronic studies are used preferentially over data from acute and subchronic studies. In cases where chronic data are not available as test-species doses, studies involving less-than-chronic exposures are used to in NOAEL and LOAEL derivation with the addition of a duration uncertainty factor.

For this study, duration uncertainty factors are applied according to USACHPPM 2000:

- Subchronic NOAEL to Chronic NOAEL: 10
- Subchronic LOAEL to Chronic NOAEL: 20

- Subchronic LOAEL to Chronic LOAEL: 4
- Acute NOAEL to Chronic NOAEL: 30
- Acute LOAEL to Chronic NOAEL: 50
- Acute LOAEL to Chronic LOAEL: 10

2.3.3 Endpoint Uncertainty Factors

Additional UFs are used to account for uncertainties in extrapolation between effect- and no-effect levels. Specifically, a NOAEL test-species dose may be estimated from a LOAEL (or LD_{50}) value, or a LOAEL may be estimated from a LD_{50}.

Extrapolation from a LOAEL or LD_{50t} to a NOAEL: Consistent with USACHPPM 2000, a UF of 10 is used with chronic LOAEL values to estimate the chronic NOAEL, which is considered conservative (Sample et al. 1996, USEPA 1996). When a LOAEL value is not available, a LD_{50} is used, although chronic NOAELs may range from 1/10 to 1/10,000 of the corresponding acute LD_{50} value (Opresko et al. 1994). For this report, an uncertainty factor of 100 is used to estimate a NOAEL value from a LD_{50} value (USACHPPM 2000).

Extrapolation from an LD_{50} to a LOAEL: Consistent with USACHPPM 2000, an UF of 20 is used conservatively to estimate a LOAEL value from a LD_{50} value (USACHPPM 2000).

2.3.4 Body-Weight Extrapolation Factor

This extrapolation is accomplished using a body weight-scaling factor to account for differences in body size (Sample et al. 1996). Numerous studies have shown that many physiological functions such as metabolic rates and responses to chemicals are a function of body size for mammals. Smaller mammals have higher metabolic rates and are usually more resistant to chemicals because of more rapid rates of detoxification. It has been shown that the best measure of body size is one based on body surface-area, which can be expressed in terms of body weight raised to a fractional power (Opresko et al. 1994, Sample et al. 1996, USEPA 1980). Dosimetric differences between the mammalian test species and wildlife receptors are accounted for using:

$$\mathrm{NOAEL}_w = \mathrm{NOAEL}_t \times \left(\frac{\mathrm{BW}_t}{\mathrm{BW}_w} \right)^{0.25}$$

where:

$NOAEL_w$	= NOAEL for the mammalian wildlife receptor (mg/kg BW-day)
$NOAEL_t$	= NOAEL for the mammalian test species (mg/kg BW-day)
BW_t	= Test species body weight (kg)
BW_w	= Wildlife receptor body weight (kg)

Scaling factors may not be appropriate for avian interspecies extrapolations. Information has shown that adjustment factors based on body size for interspecies extrapolation among avian species range from 0.63 to 1.55 (Sample et al. 1996). Therefore, a body-weight extrapolation factor is not used to derive avian NOAELs and LOAELs.

Mammalian wildlife receptor body weights are presented on Tables F.2-9 (Area A) and F.3-9 (Area B) and laboratory test species body weights are presented on Tables F.2-10 (Area A) and F.3-10 (Area B).

2.4 BIOACCUMULATION FACTORS

Bioaccumulation factors (BAFs) provide quantitative indicators of the tendency for a chemical to partition into terrestrial organisms, relative to the concentrations present in terrestrial exposure media. Exposure-point concentrations of chemicals in terrestrial prey (soil invertebrates and small mammals) and terrestrial plants are estimated using BAFs derived from the literature. The derivation of BAFs is described for organic and inorganic chemicals in the following subsections.

2.4.1 Terrestrial Plants

Exposure-point concentrations of chemicals in terrestrial plants are estimated using soil-to-plant bioaccumulation factors (uptake factors for plants, UF_{plant}) derived from the literature. UF_{plant} values are used to estimate wet-weight chemical concentrations in terrestrial plants using the same equation for invertebrates and a dry weight to wet weight conversion factor assuming plants are 80% water (Salisbury and Ross 1992). Tables F.2-11 (Area A) and F.3-11 (Area B) presents the uptake factors for plants.

Organic Chemicals: Organic chemicals may enter the plant by partitioning from contaminated soil to the roots and then translocating throughout the plant via the xylem tissue. Most bioaccumulative, lipophilic organic chemicals partition to the epidermis of the root or adhere to soil particles and are not drawn into the inner root or xylem (Paterson et al. 1990). Uptake factors for estimating concentrations of organic chemicals in plant tissues are derived from the following equation:

$$UF_{plant} = 10^{[1.588-(0.578\times \log K_{ow})]}$$

where:

UF_{plant} = Plant uptake factor (kg soil, dry weight / kg plant, dry weight)

$\log K_{ow}$ = Logarithm of the octanol:water partition coefficient

This relationship is based on a linear regression of bioaccumulation factors for 29 organic chemicals (Travis and Arms 1988). The correlation coefficient for the regression is 0.73, indicating that a majority of the variability in bioaccumulation is explained by the log K_{ow}. UF_{plant} values are derived for organic chemicals using this equation.

Inorganic Chemicals: Concentrations of inorganic chemicals in plant tissues are estimated based on generalized soil-to-plant transfer coefficients reported in a literature review. The soil-to-plant transfer factors for inorganic chemicals are equivalent to UF_{plant} values for organic chemicals and represent the ratio of the dry weight concentrations in plant tissue to the dry weight concentration of the element in root-zone soils. Bechtel-Jacobs 1998 C_p regression equation: $C_p = e^{(slope*\ln(Cs) - intercept)}$

2.4.2 Terrestrial Prey

Organic Chemicals: BAFs for estimating concentrations of organic chemicals in prey tissues are derived from linear regression equations presented in Travis and Arms (1998) and Beyer and Stafford (1993). The dry weight to wet weight (DW:WW) conversion factor is 0.2 for soil invertebrates (kg soil invertebrate dry weight per soil invertebrate wet weight; assumes invertebrates are 80% water), based on data reported in USEPA (1993). No DW:WW conversion factor was applied for small mammals. The BAF values used in to estimate concentrations of organic chemicals in soil invertebrates and small mammals are shown in Tables F.2-12 and F.2-13 (Area A) and F.3-12 and F.3-13 (Area B).

Inorganic Chemicals: Inorganic bioaccumulation factors for terrestrial prey (Tables F.2-13 and F.3-13) are wet-weight-based and are used to predict concentrations in invertebrates and small mammals according to:

$$BAF_{si} = C_{si} / C_{soil}$$

where:

BAF_{si} = Soil invertebrate uptake factor for inorganic chemicals

C_{si} = Chemical concentration predicted in soil invertebrates (mg chemical / kg soil invertebrate, dry weight)

C_{soil} = Concentration of inorganic chemical in soil (mg chemical / kg soil, dry weight)

2.5 TOXICITY EQUIVALENCY FACTORS

Dioxin/Furan COPCs represent a group of 17 polychlorinated dioxin/furan congeners of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). These congeners induce toxicity by binding to the aryl hydrocarbon (Ah) receptor, a cellular protein. All congeners are not equally toxic relative to TCDD (USEPA 1999). Therefore, the toxicity of each congener relative to TCDD is expressed in terms of a Toxicity Equivalency Factor (TEFs) established for mammals, birds, and fish (Van den Berg et. all 1998). The aggregate toxicity of a mixture of dioxins/furans in an exposure medium is expressed as TCDD-equivalents ($TEQ_{2,3,7,8\ TCCD}$), which are calculated as the TEF-weighted sum of the average daily dose (ADD_i) of the 17 congeners. $TEQ_{2,3,7,8\ TCCD}$ is calculated as follows:

$$TEQ_{2,3,7,8TCDD} = \sum_{i=1}^{17} ADD_i \times TEF_i$$

Determining the aggregate toxicity of the 17 dioxin/furan congeners in terms of $TEQ_{2,3,7,8\ TCCD}$ enables direct comparison to toxicological benchmarks developed for 2,3,7,8 TCDD (USEPA 1999). Therefore, NOAELs and LOAELs derived in the literature are used for direct evaluation of ecological effects resulting from $TEQ_{2,3,7,8\ TCCD}$ exposure.

Tables F.2-2 and F.3-2 present the total 2,3,7,8 TCDD TEQs calculated for Area A and B, respectively.

3.0 DIRECT CONTACT APPROACH

3.1 PRELIMINARY DIRECT CONTACT TOXICITY EVALUATION

Risk is assessed by comparing the preliminary exposure estimate (maximum detected concetrations - MDC) of each detected chemical to the established TRV (detailed in Section 2.1). The preliminary risk is characterized in terms of a hazard quotient (HQ), which is expressed as:

HQ = MDC/TRV

where:

HQ = Hazard Quotient for the contaminant (unitless)
MDC = Maximum Detected Concentration for contaminant (mg/kg)
TRV = Screening Level for contaminant (mg/kg)

3.2 REFINED DIRECT CONTACT TOXICITY EVALUATION

For the refined evaluation, risk is assessed by comparing the exposure point concentration (EPC) of each detected chemical to the TRV (Section 7.1.6 details EPC development). The refined risk HQ is expressed as:

HQ = EPC/TRV

where:

HQ = Hazard Quotient for the contaminant (unitless)
EPC = Calculated Exposure Point Concentration for contaminant (mg/kg)
TRV = Screening Level for contaminant (mg/kg)

An HQ of less than 1 indicates no or negligible risk. The potential for risk increases as the HQ increases above unity. However, this result should be considered in the context of other characteristics of the exposure area.

Results of the direct contact toxicity evaluation for Area A are presented in Tables F.2-6 (terrestrial plants) and F.2-8 (soil and microbial communities) and Area B results are presented in Tables F.3-6 (terrestrial plants) and F.3-8 (soil and microbial communities).

4.0 DOSE RATE MODELING APPROACH

A simplified food web model is utilized to calculate TRVs for each chemical and wildlife receptor. TRVs quantify COPC concentrations in exposure media that may result in no observable adverse effects or low observable adverse effects. The NOAEL corresponds to the greatest exposure associated with no observed adverse effects on growth, reproduction, or survival. The LOAEL corresponds to the smallest exposure associated with observed adverse effects on growth, reproduction or survival. TRVs developed by dose rate models are used to evaluate ecological effects associated with COPEC concentrations in exposure media.

4.1 PRELIMINARY DOSE RATE MODEL

Preliminary risk characterization for wildlife receptors uses the conservative preliminary exposure estimate and ecological effects evaluation to characterize risk to potential terrestrial receptors.

The simplified food web model considers the ingestion of prey, the incidental ingestion of media, and the primary routes of exposure to wildlife receptors. Chemical concentrations in prey are expressed as a function of chemical concentrations in exposure media using BAFs for terrestrial prey items. Other important parameters in the model include receptor body weight and an estimate of receptor use. As shown in the equation below, literature-derived NOAEL and LOAEL values are input into the model as the ADD variable to calculate the concentration in exposure media (C_{TRV}) that would result in a dose equivalent to a NOAEL or LOAEL.

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \ (BAF_{food} \cdot DF) + IR_s)AF}$$

where:

C_{TRV} = NOAEL or LOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg COPC/kg body weight-day)

BW = Minimum Body Weight of the receptor (kg)

IR_{food} = Maximum Ingestion Rate of food (kg food ingested per day, dry weight)

BAF_{food} = BAF of most contaminated dietary component used, specific to prey type and COPC (ratio of mg of COPC/kg fauna, wet weight to mg COPC/ kg substrate, dry weight)

DF = Dietary Fraction (most contaminated dietary component assumed to be 100% of diet)

IR_s = Maximum Incidental Ingestion Rate of soil (kg substrate ingested per day, dry weight)

AF = 100% Area Use Factor

Preliminary receptor parameters for Area A and Area B are presented on Tables F.2-9 and F.3-9, respectively. The resulting risk is characterized in terms of an HQ and is presented for wildlife receptors in Appendix F.2 and summarized in Table F.2-24 for Area A and Appendix F.3 and summarized in Table F.3-24 for Area B.

4.2 REFINED EXPOSURE ESTIMATE AND RISK CHARACTERIZATION

The refined exposure and risk characterization, Step 3a of the ecological risk assessment guidance (ERAGS), reviews and refines the conservative assumptions used in the risk calculation (USEPA 1997). In Step 3a, conservative assumptions used in the preliminary exposure and risk characterization are replaced with more environmentally realistic assumptions to evaluate risk posed by COPECs identified in the preliminary risk characterization. The addition of Step 3a focuses the outcome of the ecological screening, streamlines the review process and functions as the initial basis for ecological risk management decision-making at each site.

4.3 REFINED DOSE RATE MODEL

This step replaces the conservative assumptions used in the preliminary exposure estimate and ecological effects evaluation with more environmentally realistic assumptions including the use of average body weight, average food and substrate ingestion rates, and the use of realistic area use factor, resulting in a more realistic estimate of potential risk.

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + IR_s)AF}$$

where:

C_{TRV} = NOAEL or LOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg COPC/kg body weight-day)

BW = Average Body Weight of the receptor (kg)

IR_{food} = Average Ingestion Rate of food (kg food ingested per day, dry weight)

BAF_{food} = BAF of dietary component used, specific to prey type and COPC (ratio of mg of COPC/kg fauna, wet weight to mg COPC/ kg substrate, dry weight)

DF = Dietary Fraction

IR_s = Average Incidental Ingestion Rate of soil (kg substrate ingested per day, dry weight)

$AF_{refined}$ = Refined Area Use Factor (detailed below)

In the refined model, a realistic area use factor ($AF_{refined}$) was used to calculate the ratio of the site area to the average home range of the receptor:

$$AF_{refined} = \text{Site Area/Home Range Area}$$

Other receptor parameters in the refined model remain conservative. The conservative assumptions are summarized as follows:

- Receptors assimilate 100% of COPECs detected in the food and soil; and
- Receptors forage in the site area 100% of the time.

Refined receptor parameters for Area A and Area B are presented on Tables F.2-9 and F.3-9, respectively. The resulting risk is characterized in terms of an HQ and is presented for wildlife receptors in Appendix F.2 and summarized in Table F.2-24 for Area A and Appendix F.3 and summarized in Table F.3-24 for Area B.

4.4 EXAMPLE C_{TRV} EQUATION CALCULATION – PRELIMINARY AND REFINED

The following example C_{TRV} equation details the arsenic NOAEL-based screening level (SL) calculated for the short-tailed shrew at Area A (Table F.2-16 and F.2-17) and resulting HQs:

Preliminary

- ADD = 0.15 mg/kg bw-day (NOAEL)
- BW = 0.0125 kg (minimum body weight)
- IR_{food} = 0.003 kg dw/day (maximum ingestion rate)
- BAF_{food} = 1.1 (for the most contaminated dietary component in this case plant)
- DF = 1 (100% most contaminated dietary component in this case 100% plants)
- IR_{soil} = 0.00039 kg dw/day (maximum soil ingestion rate)
- AF = 1 (default used)

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}\ (BAF_{food} \cdot DF) + IR_s)AF} = \frac{0.15 \cdot 0.0125}{(0.003\,(1.1 \cdot 1) + 0.00039) \cdot 1} = \textbf{5.1E-01 mg/kg}$$

NOAEL HQ = MDC (mg/kg)/NOAEL-based SL (mg/kg) = $\frac{2.5}{5.1E-01}$ = **4.9E+00**

EPC NOAEL HQ = NOAEL HQ * (EPC (mg/kg) / MDC (mg/kg)) = 4.9E+00*($\frac{1.49}{2.5}$) = **2.9E+00**

Refined

- ADD = 0.15 mg/kg bw-day
- BW = 0.015 kg
- IR_{food} = 0.002 kg dw/day
- BAF_{plant} = 0.038
- BAF_{inv} = 0.215
- DF_{plant} = 0.14
- DF_{inv} = 0.86
- IR_{soil} = 0.00026 kg dw/day
- $AF_{refined}$ = 1

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF_{food}) + IR_s)AF}$$

$$= \frac{0.15 \cdot 0.015}{(0.002\,(0.038 \cdot 0.14 + 0.215 \cdot 0.86) + 0.00026) \cdot 1} = \textbf{3.5+00 mg/kg}$$

NOAEL HQ = EPC (mg/kg)/NOAEL-based SL (mg/kg) = $\frac{1.49}{3.5E+00}$ = **4.2E-01**

Tables F.2-24 and F.3-24 provides a summary of preliminary and refined HQs developed for terrestrial receptors at Area A and B, respectively.

5.0 SUMMARY

Receptor-specific exposure parameters are obtained from life history studies found in the literature. Important receptor-specific exposure parameters input into the model include: body weight, food ingestion rate, diet composition, incidental substrate ingestion rate, and area use factor.

The dose-response relationships for chemicals of potential interest are expressed as NOAELs and LOAELs for wildlife receptors, which are defined as a daily ingested amount (mg COPC/kg body weight-day) that is associated with a specified growth, reproductive, developmental, or survival effect.

Extrapolation and uncertainty factors are applied to literature-based toxicological endpoints to account for differences in a controlled laboratory setting and an ecologically relevant setting. Extrapolation and uncertainty factors are based on: (1) the duration of exposure, (2) the endpoint measured, and (3) differences in body weights among test and receptor species.

Bioaccumulation accumulation factors provide quantitative indicators of the tendency for a chemical to partition into organisms, relative to the concentrations present in exposure media. Exposure-point concentrations of chemicals in terrestrial prey (soil invertebrates and small mammals) are estimated using several BAFs derived from the literature.

COPC concentrations in prey and media, receptor-specific exposure parameters, literature-based NOAEL and LOAEL values, and bioaccumulation factors are used in the model to calculate the concentration in exposure media (C_{TRV}) that would result in a dose equivalent to a NOAEL or LOAEL. The dose rate modeling approach is used to evaluate the potential mobility of COPCs through varying trophic associations.

6.0 REFERENCES

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APPENDIX F.2

AREA A SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

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Table F.2-1
SLERA Occurence/Distribution - Area A Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
TAL Metals							
Aluminum	7429-90-5	6,620	19,400	mg/kg	54SB23A (C)	25/25	2.4 - 6.8
Antimony	7440-36-0	0.04	0.76	mg/kg	54SB34A (D)	13/22	0.0386 - 0.43
Arsenic	7440-38-2	0.67	2.5	mg/kg	54SB31A	25/25	0.058 - 0.36
Barium	7440-39-3	84.9	206	mg/kg	54SB38A (D)	25/25	0.02 - 0.103
Beryllium	7440-41-7	0.21	1	mg/kg	54SB38A (D)	25/25	0.01 - 0.0267
Cadmium	7440-43-9	0.1	1.6	mg/kg	54SB57A (E)	6/25	0.03 - 0.25
Calcium	7440-70-2	1,020	21,500	mg/kg	54SB21A	25/25	1 - 17.5
Chromium	7440-47-3	12	29.5	mg/kg	54SB31A	25/25	0.07 - 0.998
Cobalt	7440-48-4	5.8	16	mg/kg	54SB57A (E)	25/25	0.07 - 0.233
Copper	7440-50-8	3.9	84.1	mg/kg	54SB34A (D)	25/25	0.15 - 0.516
Iron	7439-89-6	13,700	27,200	mg/kg	54SB25A	25/25	0.731 - 1.7
Lead	7439-92-1	6.4	528	mg/kg	54SB34A (D)	26/26	0.041 - 0.776
Magnesium	7439-95-4	1,880	5,000	mg/kg	54SB57A (E)	25/25	0.66 - 7.67
Manganese	7439-96-5	309	909	mg/kg	54SB38A (D)	25/25	0.02 - 0.474
Mercury	7439-97-6	0.017	0.31	mg/kg	54SB33A (B)	25/25	0.0077 - 0.021
Nickel	7440-02-0	8.4	13.5	mg/kg	54SB32A	25/25	0.0775 - 0.13
Potassium	7440-09-7	832	1,810	mg/kg	54SB57A (E)	25/25	4.3 - 14.9
Selenium	7782-49-2	0.057	2	mg/kg	54SB38A (D)	23/25	0.0486 - 0.41
Silver	7440-22-4	0.049	0.089	mg/kg	54SB57A (E)	3/25	0.0178 - 0.1
Sodium	7440-23-5	38	469	mg/kg	54SB38A (D)	21/25	27.1 - 36.4
Thallium	7440-28-0	0.12	0.2	mg/kg	54SB57A (E)	3/15	0.0733 - 0.64
Vanadium	7440-62-2	16	55.3	mg/kg	54SB23A (C)	25/25	0.07 - 0.401
Zinc	7440-66-6	43.2	337	mg/kg	54SB34A (D)	25/25	0.11 - 0.789
TCL Pesticides/PCBs							
4,4'-DDE	72-55-9	4.8E-03	4.8E-03	mg/kg	54SB57A (E)	1/14	0.0004 - 0.00335
4,4'-DDT	50-29-3	2.1E-03	2.6E-02	mg/kg	54SB57A (E)	3/14	0.00039 - 0.00312
alpha-Chlordane	5103-71-9	3.1E-03	3.1E-03	mg/kg	54SB57A (E)	1/14	0.00022 - 0.0026
delta-BHC	319-86-8	5.0E-04	5.0E-04	mg/kg	54SB30A	1/14	0.00015 - 0.00226
Endosulfan Sulfate	1031-07-8	1.8E-03	1.8E-03	mg/kg	54SB25A	1/14	0.0004 - 0.00311
Endrin aldehyde	7421-93-4	1.2E-03	1.2E-03	mg/kg	54SB30A	1/14	0.00035 - 0.00252
gamma-BHC (Lindane)	58-89-9	1.6E-03	1.6E-03	mg/kg	54SB30A	1/14	0.00022 - 0.00304
gamma-Chlordane	5103-74-2	1.0E-02	1.0E-02	mg/kg	54SB57A (E)	1/14	0.00035 - 0.00265
Heptachlor	76-44-8	1.1E-03	4.8E-03	mg/kg	54SB30A	2/14	0.00034 - 0.00285
Heptachlor epoxide	1024-57-3	1.1E-01	1.1E-01	mg/kg	54SB32A	1/14	0.00026 - 0.00401
Methoxychlor	72-43-5	6.3E-03	7.4E-03	mg/kg	54SB30A	2/14	0.0014 - 0.00541
Aroclor 1254	11097-69-1	2.8E-02	2.0E-01	mg/kg	54SB57A (E)	3/14	0.0068 - 0.009
Aroclor 1260	11096-82-5	7.8E-02	7.8E-02	mg/kg	54SB3A	1/14	0.005 - 0.0111
TCL SVOCs							
2-Nitroaniline	88-74-4	5.5E-02	5.5E-02	mg/kg	54SB27A (D)	1/18	0.029 - 0.029
Bis(2-ethylhexyl)phthalate	117-81-7	6.1E-02	2.6E+00	mg/kg	54SB27A (D)	13/18	0.032 - 0.032
Di-n-butylphthalate	84-74-2	4.9E-02	8.0E-01	mg/kg	54SB27A (D)	6/18	0.38 - 0.42
Di-n-octylphthalate	117-84-0	5.7E-02	3.2E-01	mg/kg	54SB28A	7/18	0.38 - 0.42
Diethylphthalate	84-66-2	1.2E-01	6.8E-01	mg/kg	54SB32A	5/18	0.38 - 0.42
N-Nitrosodiphenylamine	86-30-6	6.6E-02	1.2E+00	mg/kg	54SB27A (D)	3/18	0.38 - 0.42
Dioxin/Furans							
Total 2,3,7,8-TCDD TEQ (Mammalian)	--	3.8E-08	1.7E-05	mg/kg	54SB33A (B)	11/11	--
Total 2,3,7,8-TCDD TEQ (Avian)	--	1.3E-08	1.7E-05	mg/kg	54SB33A (B)	11/11	--
PAHs							
Acenaphthene	83-32-9	3.3E-02	1.6E+00	mg/kg	54SB27A (D)	9/13	0.0058 - 0.051
Acenaphthylene	208-96-8	2.2E-02	1.1E+00	mg/kg	54SB27A (D)	5/18	0.0059 - 0.051
Benzo(a)anthracene	56-55-3	3.6E-03	4.9E-02	mg/kg	54SB30A	12/18	0.0022 - 0.01
Benzo(a)pyrene	50-32-8	3.4E-03	5.8E-02	mg/kg	54SB25A	7/18	0.0016 - 0.01
Benzo(b)fluoranthene	205-99-2	5.2E-03	1.1E-01	mg/kg	54SB27A (D)	9/18	0.0017 - 0.01
Benzo(g,h,i)perylene	191-24-2	1.1E-02	3.2E-02	mg/kg	54SB24A	4/18	0.0036 - 0.01
Benzo(k)fluoranthene	207-08-9	3.7E-03	5.7E-02	mg/kg	54SB25A	8/18	0.0014 - 0.01
Chrysene	218-01-9	4.5E-03	2.1E-01	mg/kg	54SB33A (B)	10/18	0.0024 - 0.01
Dibenz(a,h)anthracene	53-70-3	1.6E-02	3.6E-02	mg/kg	54SB24A	4/18	0.0042 - 0.01
Fluoranthene	206-44-0	4.8E-03	9.0E-02	mg/kg	54SB25A	15/18	0.0021 - 0.02
Indeno(1,2,3-cd)pyrene	193-39-5	1.4E-02	3.9E-01	mg/kg	54SB33A (B)	5/18	0.0025 - 0.01
Naphthalene	91-20-3	4.6E-02	9.4E+00	mg/kg	54SB30A	9/12	0.014 - 0.049
Phenanthrene	85-01-8	1.9E-02	1.2E-01	mg/kg	54SB30A	5/18	0.0085 - 0.051
Pyrene	129-00-0	1.3E-02	1.8E-01	mg/kg	54SB27A (D)	13/18	0.0043 - 0.02
Explosives							
1,3,5-Trinitrobenzene	99-35-4	7.6E+00	7.6E+00	mg/kg	54SB27A (D)	1/17	0.079 - 0.246
2,4,6-Trinitrotoluene	118-96-7	4.3E-01	1.3E+02	mg/kg	54SB27A (D)	4/29	0.051 - 0.16
2,4-Dinitrotoluene	121-14-2	1.7E+01	1.7E+01	mg/kg	54SB27A (D)	1/29	0.073 - 0.12
2,6-Dinitrotoluene	606-20-2	1.1E+01	1.1E+01	mg/kg	54SB27A (D)	1/29	0.099 - 0.19
2-Amino-4,6-Dinitrotoluene	35572-78-2	1.7E-01	5.7E+00	mg/kg	54SB27A (D)	3/29	0.088 - 0.106
4-Amino-2,6-Dinitrotoluene	1946-51-0	7.6E-01	5.2E+00	mg/kg	54SB27A (D)	2/29	0.053 - 0.095
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	2691-41-0	6.8E+00	6.8E+00	mg/kg	54SB27A (D)	1/29	0.1 - 0.208

Table F.2-1
SLERA Occurence/Distribution - Area A Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon

(B) = Re-sampled; Pesticides and PCBs analyzed January 2007.
(C) = Re-sampled; Pesticides, PCBs, and Dioxin/Furans analyzed January 2007.
(D) = Re-sampled; Dioxin/Furans analyzed January 2007.
(E) = Re-sampled; PCBs and PCB Congeners analyzed January 2007.

Refer to Table 7-7 for Total 2,3,7,8-TCDD TEQ Calculations

Table F.2-2
Area A Dioxin/Furan Equivalents
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	Mammalian TEF	Avian TEF	54SB23A [C] 12/3/2002 0-1		54SB25A 12/3/2002 0-1		54SB27A [D] 12/3/2002 0-1		54SB30A 12/3/2002 0-1		54SB32A 12/3/2002 0-1		54SB33A [B] 12/3/2002 1-2	
			Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
Dioxin/Furans (pg/g)														
1,2,3,4,6,7,8,9-OCDD (OCDD)	0.0003	0.0001	326		1500	J,c	4,220	E,J,q	122	J,c	530	J,c	3,040	J,c
1,2,3,4,6,7,8,9-OCDF (OCDD)	0.0003	0.0001	0.491	A	15.8	J,c	23.3		<10		28.5	J,c	163	J,c
1,2,3,4,6,7,8-HpCDD	0.01	0.001	6.12		34.4		69.4		6		66.8		331	
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.322	A	3.8	J	7.12		0.9	MJ	14.3		58.6	
1,2,3,4,7,8,9-HpCDF	0.01	0.01	<0.536	U	<5		0.47	A	<5		1.1	J	5.5	
1,2,3,4,7,8-HxCDD	0.1	0.05	0.109	A	<5		0.523	A	<5		1.3	J	4.6	J
1,2,3,4,7,8-HxCDF	0.1	0.1	<0.536	U	<5		0.513	A	<5		4.8	J	9.6	
1,2,3,6,7,8-HxCDD	0.1	0.01	0.142	A	0.57	MJ	1.44	A	<5		4	J	19.6	
1,2,3,6,7,8-HxCDF	0.1	0.1	<0.536	U	<5		0.345	A	<5		1.8	MJ	3.5	MJ
1,2,3,7,8,9-HxCDD	0.1	0.1	0.215	A	<5		1.13	A	<5		4.4	J	17.8	
1,2,3,7,8,9-HxCDF	0.1	0.1	<0.536	U	<5		0.151	A	<5		<5		1.4	J
1,2,3,7,8-PeCDD	1	1	<0.536	U	<5		0.326	A	<5		1.4	J	3.6	J
1,2,3,7,8-PeCDF	0.03	0.1	0.088	A,J,w	<5		0.279	A	<5		1.8	J	2.2	J
2,3,4,6,7,8-HxCDF	0.1	0.1	<0.536	U	<5		0.376	A	<5		2.2	J	5	
2,3,4,7,8-PeCDF	0.3	1	0.103	A,B,z	<5		0.406	A	<5		2.8	J	3.8	J
2,3,7,8-TCDD	1	1	0.204	A,J,w	<1		<0.258	U	<1		0.33	J	0.83	J
2,3,7,8-TCDF	0.1	1	0.44	A,B,z	<1		0.511	A,B,z	<1		2		2.9	
Total 2,3,7,8-TCDD Equivalents (Mammalian)			0.416		0.894		2.947		0.106		5.664		16.988	
Total 2,3,7,8-TCDD Equivalents (Avian)			0.283		0.230		1.622		0.027		8.412		16.798	

Table F.2-2
Area A Dioxin/Furan Equivalents
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	Mammalian TEF	Avian TEF	54SB34A [D] 12/3/2002 0-1		54SB38A [D] 12/4/2002 0-1		54SB58A [D] 8/17/2004 0-1		54SB82A 1/12/2007 0-0.5		54SB83A 1/11/2007 0-0.5	
			Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
Dioxin/Furans (pg/g)												
1,2,3,4,6,7,8,9-OCDD (OCDD)	0.0003	0.0001	132		766		151		122		113	
1,2,3,4,6,7,8,9-OCDF (OCDD)	0.0003	0.0001	<0.964	U	8.32	A	1.36	A	<0.997	U	<0.923	U
1,2,3,4,6,7,8-HpCDD	0.01	0.001	1.69	A	25.6		6.83		1.87	A,B,z	2.33	A
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.112	A,J,w	2.88	A	1.02	A	0.114	A	0.109	A,B,z
1,2,3,4,7,8,9-HpCDF	0.01	0.01	<0.482	U	0.18	A	<0.468	U	<0.498	U	<0.461	U
1,2,3,4,7,8-HxCDD	0.1	0.05	<0.482	U	0.319	A	0.152	A	<0.498	U	<0.461	U
1,2,3,4,7,8-HxCDF	0.1	0.1	<0.482	U	0.239	A	0.15	A	<0.498	U	<0.461	U
1,2,3,6,7,8-HxCDD	0.1	0.01	<0.482	U	0.666	A	0.259	A	<0.498	U	<0.461	U
1,2,3,6,7,8-HxCDF	0.1	0.1	<0.482	U	0.19	A	0.148	A,J,w	<0.498	U	<0.461	U
1,2,3,7,8,9-HxCDD	0.1	0.1	<0.482	U	0.701	A	0.333	A,J,w	<0.498	U	<0.461	U
1,2,3,7,8,9-HxCDF	0.1	0.1	<0.482	U	0.0879	A	<0.468	U	<0.498	U	<0.461	U
1,2,3,7,8-PeCDD	1	1	<0.482	U	<0.511	U	<0.468	U	<0.498	U	<0.461	U
1,2,3,7,8-PeCDF	0.03	0.1	0.0656	A	0.151	,J,w	0.172	A,B,z	0.0738	A,B,z	<0.461	U
2,3,4,6,7,8-HxCDF	0.1	0.1	<0.482	U	0.219	A	0.135	A	<0.498	U	<0.461	U
2,3,4,7,8-PeCDF	0.3	1	0.0887	A	0.217	A,B,z	0.2	A,B,z	0.0957	A,B,z	<0.461	U
2,3,7,8-TCDD	1	1	<0.0964	U	<0.102	U	2.13		<0.0997	U	<0.108	U
2,3,7,8-TCDF	0.1	1	0.345	A,B,z	0.554	A,B,z	0.922	A,B,z	0.463	A,B,z	0.402	,B,z
Total 2,3,7,8-TCDD Equivalents (Mammalian)			0.086		0.766		2.372		0.038		0.057	
Total 2,3,7,8-TCDD Equivalents (Avian)			0.111		0.315		2.249		0.013		0.014	

Notes:

pg/g = Picogram Per Gram
ft/bgs = Feet Below Ground Surface
TEF = Toxicity Equivalency Factor
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code

Total 2,3,7,8-TCDD Equivalents are calculated by summing the detected concentration times the TEF for each chemical. Non-detects, R-flagged data, and B-flagged data are excluded from summed total.

Qualifiers:

- A Amount detected is less than the Lower Calibration Limit.
- B Not detected substantially above the level reported in laboratory or field blanks.
- E Concentration exceeded the upper level of the calibration range of the instrument for that specific analysis.
- J Analyte present. Reported value may not be accurate or precise.
- U The compound was analyzed for but not detected. The reporting limit will be adjusted to reflect any dilution, and for soil, the percent moisture.
- c Calibration failure; poor (RRF) or unstable (%D) response
- q Concentration exceeded the linear range

Table F.2-3
Non-detected Chemicals MDL Screening for Area A - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
TAL Metals																	
CADMIUM	7440-38-2	mg/kg	19	0.03	0.05	18	A	N	60	B	N	43	A	N	46	A	N
SILVER	7440-22-4	mg/kg	22	0.08	0.1	560	A	N	50	E	N	4.2	A	N	14	A	N
SODIUM	7440-23-5	mg/kg	10	31.4	34.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
ANTIMONY	7440-36-0	mg/kg	15	0.0386	0.46	5	F	N	78	A	N	--	--	NS	--	--	NS
SELENIUM	7782-49-2	mg/kg	3	0.0486	0.0486	0.52	A	N	4.1	A	N	--	--	NS	--	--	NS
THALLIUM	7440-28-0	mg/kg	22	0.26	0.64	--	--	--	--	--	NS	--	--	NS	--	--	NS
MERCURY	7439-97-6	mg/kg	1	0.0077	0.0077	0.3	F	N	--	--	NS	--	--	NS	--	--	NS
Pesticides/PCBs																	
4,4'-DDD	72-54-8	ug/kg	26	0.32	2.87	100	G	N	100	C	N	--	--	NS	--	--	NS
4,4'-DDE	72-55-9	ug/kg	25	0.4	3.46	100	G	N	100	C	N	--	--	NS	--	--	NS
4,4'-DDT	50-29-3	ug/kg	23	0.39	3.23	100	G	N	100	C	N	93	A	N	21	A	N
ALDRIN	309-00-2	ug/kg	26	0.17	2.7	100	G	N	100	C	N	--	--	NS	--	--	NS
ALPHA-BHC	319-84-6	ug/kg	26	0.26	3.03	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
ALPHA-CHLORDANE	5103-71-9	ug/kg	25	0.22	2.69	100	G	N	100	C	N	--	--	NS	--	--	NS
BETA-BHC	319-85-7	ug/kg	26	0.28	3.76	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
DELTA-BHC	319-86-8	ug/kg	25	0.15	2.45	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
DIELDRIN	60-57-1	ug/kg	26	0.43	2.83	100	G	N	100	C	N	22	A	N	4.9	A	N
ENDOSULFAN I	959-98-8	ug/kg	26	0.43	3.14	--	--	NS	--	--	NS	--	--	NS	--	--	NS
ENDOSULFAN II	33213-65-9	ug/kg	26	0.58	1.89	--	--	NS	--	--	NS	--	--	NS	--	--	NS
ENDOSULFAN SULFATE	1031-07-8	ug/kg	25	0.4	3.22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
ENDRIN	72-20-8	ug/kg	26	0.35	3.36	100	G	N	100	C	N	--	--	NS	--	--	NS
ENDRIN ALDEHYDE	7421-93-4	ug/kg	25	0.35	4.01	100	G	N	100	C	N	--	--	NS	--	--	NS
ENDRIN KETONE	53494-70-5	ug/kg	26	0.39	3.92	100	G	N	100	C	N	--	--	NS	--	--	NS
GAMMA-BHC (LINDANE)	58-89-9	ug/kg	25	0.22	3.14	100	G	N	100	C	N	--	--	NS	--	--	NS
GAMMA-CHLORDANE	5103-74-2	ug/kg	25	0.35	2.74	100	G	N	100	C	N	--	--	NS	--	--	NS
HEPTACHLOR	76-44-8	ug/kg	24	0.34	2.95	100	G	N	100	C	N	--	--	NS	--	--	NS
HEPTACHLOR EPOXIDE	1024-57-3	ug/kg	25	0.26	4.15	100	G	N	100	C	N	--	--	NS	--	--	NS
METHOXYCHLOR	72-43-5	ug/kg	24	1.4	5.6	100	G	N	100	C	N	--	--	NS	--	--	NS
TOXAPHENE	8001-35-2	ug/kg	26	18	82.2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1016	12674-11-2	ug/kg	26	4.9	15	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1221	11104-28-2	ug/kg	26	10.3	15	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1232	11141-16-5	ug/kg	26	5.1	9.96	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1242	53469-21-9	ug/kg	26	6.16	10	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1248	12672-29-6	ug/kg	26	4.2	9.1	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1254	11097-69-1	ug/kg	19	6.8	9	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1260	11096-82-5	ug/kg	25	5	12.1	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
TCL SVOCs																	
1,1'-BIPHENYL	92-52-4	ug/kg	18	22	22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	ug/kg	18	30	30	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,5-TRICHLOROPHENOL	95-95-4	ug/kg	18	49	49	4,000	F	N	9,000	B	N	--	--	NS	--	--	NS
2,4,6-TRICHLOROPHENOL	88-06-2	ug/kg	18	50	50	100	G	N	10,000	B	N	--	--	NS	--	--	NS
2,4-DICHLOROPHENOL	120-83-2	ug/kg	18	22	22	100	G	N	100	C	N	--	--	NS	--	--	NS
2,4-DIMETHYLPHENOL	105-67-9	ug/kg	18	30	30	100	G	N	100	C	N	--	--	NS	--	--	NS
2,4-DINITROPHENOL	51-28-5	ug/kg	18	170	170	20,000	F	N	100	C	Y	--	--	NS	--	--	NS
2,4-DINITROTOLUENE	121-14-2	ug/kg	17	20	20	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,6-DINITROTOLUENE	606-20-2	ug/kg	17	21	21	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-CHLORONAPHTHALENE	91-58-7	ug/kg	18	22	22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-CHLOROPHENOL	95-57-8	ug/kg	18	18	18	7,000	F	N	10,000	B	N	--	--	NS	--	--	NS
2-METHYLNAPHTHALENE	91-57-6	ug/kg	18	24	24	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-METHYLPHENOL	95-48-7	ug/kg	18	27	27	100	G	N	100	C	N	--	--	NS	--	--	NS
2-NITROANILINE	88-74-4	ug/kg	17	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-NITROPHENOL	88-75-5	ug/kg	18	26	26	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3,3'-DICHLOROBENZIDINE	91-94-1	ug/kg	18	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3-NITROANILINE	99-09-2	ug/kg	18	34	34	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4,6-DINITRO-2-METHYLPHENOL	534-52-1	ug/kg	18	35	35	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-BROMOPHENYL PHENYL ETHER	101-55-3	ug/kg	18	380	420	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-CHLORO-3-METHYLPHENOL	59-50-7	ug/kg	18	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-CHLOROANILINE	106-47-8	ug/kg	18	16	16	20,000	F	N	--	--	NS	--	--	NS	--	--	NS
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	ug/kg	18	380	420	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-METHYLPHENOL	106-44-5	ug/kg	18	48	48	100	G	N	100	C	N	--	--	NS	--	--	NS

Table F.2-3
Non-detected Chemicals MDL Screening for Area A - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
4-NITROANILINE	100-01-6	ug/kg	18	39	39	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-NITROPHENOL	100-02-7	ug/kg	18	75	75	100	G	N	7,000	B	N	--	--	NS	--	--	NS
ACENAPHTHENE	83-32-9	ug/kg	18	31	31	100	G	N	100	C	N	--	--	NS	--	--	NS
ACENAPHTHYLENE	208-96-8	ug/kg	18	17	17	100	G	N	100	C	N	--	--	NS	--	--	NS
ACETOPHENONE	98-86-2	ug/kg	18	23	23	--	--	NS	--	--	NS	--	--	NS	--	--	NS
ANTHRACENE	120-12-7	ug/kg	18	25	25	100	G	N	100	C	N	--	--	NS	--	--	NS
ATRAZINE	1912-24-9	ug/kg	18	16	16	--	--	NS	--	--	NS	--	--	NS	--	--	NS
BENZALDEHYDE	100-52-7	ug/kg	18	39	39	--	--	NS	--	--	NS	--	--	NS	--	--	NS
BENZO(A)ANTHRACENE	56-55-3	ug/kg	17	29	29	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(A)PYRENE	50-32-8	ug/kg	17	23	23	100	G	N	--	--	NS	--	--	NS	--	--	NS
BENZO(B)FLUORANTHENE	205-99-2	ug/kg	18	36	36	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(G,H,I)PERYLENE	191-24-2	ug/kg	17	23	23	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(K)FLUORANTHENE	207-08-9	ug/kg	17	29	29	100	G	N	100	C	N	--	--	NS	--	--	NS
BIS(2-CHLOROETHOXY)METHANE	111-91-1	ug/kg	18	21	21	--	--	NS	--	--	NS	--	--	NS	--	--	NS
BIS(2-CHLOROETHYL)ETHER	111-44-4	ug/kg	18	18	18	--	--	NS	--	--	NS	--	--	NS	--	--	NS
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	ug/kg	5	32	32	--	--	NS	--	--	NS	--	--	NS	--	--	NS
BUTYL BENZYL PHTHALATE	85-68-7	ug/kg	18	380	420	--	--	NS	--	--	NS	--	--	NS	--	--	NS
CAPROLACTAM	105-60-2	ug/kg	18	62	62	--	--	NS	--	--	NS	--	--	NS	--	--	NS
CARBAZOLE	86-74-8	ug/kg	18	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
CHRYSENE	218-01-9	ug/kg	17	28	28	100	G	N	100	C	N	--	--	NS	--	--	NS
DI-N-BUTYL PHTHALATE	84-74-2	ug/kg	12	380	420	200,000	F	N	--	--	NS	--	--	NS	--	--	NS
DI-N-OCTYL PHTHALATE	117-84-0	ug/kg	11	380	420	--	--	NS	--	--	NS	--	--	NS	--	--	NS
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/kg	18	21	21	100	G	N	100	C	N	--	--	NS	--	--	NS
DIBENZOFURAN	132-64-9	ug/kg	18	24	24	--	--	NS	--	--	NS	--	--	NS	--	--	NS
DIETHYL PHTHALATE	84-66-2	ug/kg	13	390	420	--	--	NS	--	--	NS	--	--	NS	--	--	NS
DIMETHYL PHTHALATE	131-11-3	ug/kg	18	380	420	--	--	NS	--	--	NS	--	--	NS	--	--	NS
FLUORANTHENE	206-44-0	ug/kg	15	18	18	100	G	N	100	C	N	--	--	NS	--	--	NS
FLUORENE	86-73-7	ug/kg	18	18	18	100	G	N	100	C	N	--	--	NS	--	--	NS
HEXACHLOROBENZENE	118-74-1	ug/kg	18	22	22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
HEXACHLOROBUTADIENE	87-68-3	ug/kg	18	24	24	--	--	NS	--	--	NS	--	--	NS	--	--	NS
HEXACHLOROCYCLOPENTADIENE	77-47-4	ug/kg	18	67	67	--	--	NS	--	--	NS	--	--	NS	--	--	NS
HEXACHLOROETHANE	67-72-1	ug/kg	18	17	17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/kg	18	20	20	100	G	N	100	C	N	--	--	NS	--	--	NS
ISOPHORONE	78-59-1	ug/kg	18	28	28	--	--	NS	--	--	NS	--	--	NS	--	--	NS
NAPHTHALENE	91-20-3	ug/kg	18	21	21	100	G	N	100	C	N	--	--	NS	--	--	NS
N-NITROSO-DI-N-PROPYLAMINE	621-64-7	ug/kg	18	21	21	--	--	NS	--	--	NS	--	--	NS	--	--	NS
N-NITROSODIPHENYLAMINE	86-30-6	ug/kg	15	380	420	--	--	NS	--	--	NS	--	--	NS	--	--	NS
NITROBENZENE	98-95-3	ug/kg	18	28	28	--	--	NS	--	--	NS	--	--	NS	--	--	NS
PENTACHLOROPHENOL	87-86-5	ug/kg	18	46	46	5,000	A	N	31,000	A	N	2,100	A	N	2,800	A	N
PHENANTHRENE	85-01-8	ug/kg	18	24	24	100	G	N	100	C	N	--	--	NS	--	--	NS
PHENOL	108-95-2	ug/kg	18	34	34	100	G	N	30,000	B	N	--	--	NS	--	--	NS
PYRENE	129-00-0	ug/kg	15	24	24	100	G	N	100	C	N	--	--	NS	--	--	NS
Dioxin/Furans																	
1,2,3,4,6,7,8,9-OCDF (OCDF)	39001-02-0	pg/g	4	0.923	1.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,4,7,8,9-HpCDF	55673-89-7	pg/g	7	0.461	0.7	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,4,7,8-HxCDD	39227-28-6	pg/g	5	0.461	0.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,4,7,8-HxCDF	70648-26-9	pg/g	6	0.2	0.536	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,6,7,8-HxCDD	57653-85-7	pg/g	4	0.461	0.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,6,7,8-HxCDF	57117-44-9	pg/g	6	0.2	0.536	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8,9-HxCDD	19408-74-3	pg/g	5	0.461	0.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8,9-HxCDF	72918-21-9	pg/g	8	0.3	0.536	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8-PeCDD	40321-76-4	pg/g	8	0.3	0.536	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8-PeCDF	57117-41-6	pg/g	3	0.2	0.461	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,4,6,7,8-HxCDF	60851-34-5	pg/g	6	0.2	0.536	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,4,7,8-PeCDF	57117-31-4	pg/g	3	0.2	0.461	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,7,8-TCDD	1746-01-6	pg/g	7	0.0964	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,7,8-TCDF	51207-31-9	pg/g	2	0.1	0.2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total HpCDFs	--	pg/g	1	0.482	0.482	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total PeCDDs	--	pg/g	4	0.3	0.498	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total PeCDFs	--	pg/g	2	0.3	0.461	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Table F.2-3
Non-detected Chemicals MDL Screening for Area A - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
Total TCDD	41903-57-5	pg/g	7	0.0964	0.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total TCDF	55722-27-5	pg/g	1	0.2	0.2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
TCL PAHs																	
ACENAPHTHENE	83-32-9	ug/kg	10	5.9	49	100	G	N	100	C	N	--	--	NS	--	--	NS
ACENAPHTHYLENE	208-96-8	ug/kg	13	5.9	51	100	G	N	100	C	N	--	--	NS	--	--	NS
ANTHRACENE	120-12-7	ug/kg	18	5.4	51	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(A)ANTHRACENE	56-55-3	ug/kg	6	2.2	2.2	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(A)PYRENE	50-32-8	ug/kg	11	1.6	10	100	G	N	--	--	NS	--	--	NS	--	--	NS
BENZO(B)FLUORANTHENE	205-99-2	ug/kg	9	1.7	1.7	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(G,H,I)PERYLENE	191-24-2	ug/kg	14	3.6	10	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(K)FLUORANTHENE	207-08-9	ug/kg	10	1.4	9.5	100	G	N	100	C	N	--	--	NS	--	--	NS
CHRYSENE	218-01-9	ug/kg	8	2.4	2.4	100	G	N	100	C	N	--	--	NS	--	--	NS
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/kg	14	4.2	10	100	G	N	100	C	N	--	--	NS	--	--	NS
FLUORANTHENE	206-44-0	ug/kg	3	2.1	2.1	100	G	N	100	C	N	--	--	NS	--	--	NS
FLUORENE	86-73-7	ug/kg	18	14	51	100	G	N	100	C	N	--	--	NS	--	--	NS
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/kg	13	2.5	10	100	G	N	100	C	N	--	--	NS	--	--	NS
NAPHTHALENE	91-20-3	ug/kg	9	14	51	100	G	N	100	C	N	--	--	NS	--	--	NS
PHENANTHRENE	85-01-8	ug/kg	13	8.5	51	100	G	N	100	C	N	--	--	NS	--	--	NS
PYRENE	129-00-0	ug/kg	5	4.3	20	100	G	N	100	C	N	--	--	NS	--	--	NS
PCB Congeners																	
123-PeCB	65510-44-3	pg/g	1	3.83	3.83	--	--	NS	--	--	NS	--	--	NS	--	--	NS
126-PeCB	57465-28-8	pg/g	1	3.83	3.83	--	--	NS	--	--	NS	--	--	NS	--	--	NS
169-HxCB	32774-16-6	pg/g	1	3.83	3.83	--	--	NS	--	--	NS	--	--	NS	--	--	NS
209-DeCB	2051-24-3	pg/g	1	3.83	3.83	--	--	NS	--	--	NS	--	--	NS	--	--	NS
81-TeCB	70362-50-4	pg/g	1	3.83	3.83	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Explosives																	
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	40	0.079	0.246	8.6	I	N	18.1	I	N	--	--	NS	--	--	NS
1,3-DINITROBENZENE	99-65-0	mg/kg	41	0.0518	0.097	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,6-TRINITROTOLUENE	118-96-7	mg/kg	37	0.051	0.16	2.4	H	N	1.2	H	N	--	--	NS	--	--	NS
2,4-DINITROTOLUENE	121-14-2	mg/kg	40	0.0728	0.12	5.3	I	N	19.8	I	N	--	--	NS	--	--	NS
2,6-DINITROTOLUENE	606-20-2	mg/kg	40	0.0987	0.19	4.5	I	N	6.9	I	N	--	--	NS	--	--	NS
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	38	0.088	0.106	80	J	N	--	--	NS	--	--	NS	--	--	NS
2-NITROTOLUENE	88-72-2	mg/kg	41	0.0707	0.16	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3-NITROTOLUENE	99-08-1	mg/kg	41	0.11	0.138	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	mg/kg	39	0.053	0.095	80	J	N	--	--	NS	--	--	NS	--	--	NS
4-NITROTOLUENE	99-99-0	mg/kg	41	0.116	0.27	--	--	NS	--	--	NS	--	--	NS	--	--	NS
HMX (OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TET)	2691-41-0	mg/kg	40	0.1	0.208	--	--	NS	6.3	I	N	--	--	NS	--	--	NS
NITROBENZENE	98-95-3	mg/kg	41	0.0885	0.17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	121-82-4	mg/kg	41	0.0887	0.28	100	K	N	98.6	I	N	--	--	NS	--	--	NS
TETRYL (METHYL-2,4,6-TRINITROPHENYLNITRAMINE)	479-45-8	mg/kg	41	0.0587	0.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Nitroglycerin																	
NITROGLYCERIN	55-63-0	mg/kg	37	1	1.45	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
SL = Screening Level
Eco SSL = Ecological Soil Screening Level

Sources:
A = USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
B = ORNL - Earthworms - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
C = BTAG - Fauna - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
E = ORNL - Microbial Processes - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
F = ORNL - Plants - Toxilogical Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision Efroymson et al.)
G = BTAG - Flora - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
H = Best, E.P.H., H.E. Tatem, K.N. Geter, M.L. Wells and B.K. Lane. 2004. Toxicity and Metabolites of 2,4,6 Trinitrotoluene (TNT) in Plants and Worms from Exposure to Aged Soil.
I = Kuperman. R. 2003. Development of Ecological Toxicity and Biomagnification Data for Explosives Contaminants in Soil.
J = Pennington, Judith C. 1988. Plant Uptake of 2,4,6-Trinitrotoluene, 4-Amino-2,6-Dinitrotoluene, and 2-Amino-4,6-Dinitrotoluene Using 14C-Labeled and Unlabeled Compounds.
K = Simini, M., R.S. Wentsel, R.T. Checkai, C.T. Phillips, N.A. Chester, M.A. Major, and J.C. Amos. 1995. Evaluation of Soil Toxicity at Joliet Army Ammunition Plant.

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available

Table F.2-4
EPC Summary for COPECs - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Surface Soil	Aluminum	mg/kg	11,408	12,632	19,400	12,632	mg/kg	95% Student's t UCL	ProUCL 4.0
	Arsenic	mg/kg	1.33	1.49	2.5	1.49	mg/kg	95% Student's t UCL	ProUCL 4.0
	Cadmium	mg/kg	0.837	0.44	1.6	0.44	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Calcium	mg/kg	3,020	6,615	21,500	6,615	mg/kg	95% Chebyshev (Mean,Sd) UCL	ProUCL 4.0
	Chromium	mg/kg	18.93	20.46	29.5	20.46	mg/kg	95% Student's t UCL	ProUCL 4.0
	Iron	mg/kg	19,036	20,416	27,200	20,416	mg/kg	95% Student's t UCL	ProUCL 4.0
	Lead	mg/kg	69.72	110.7	528	110.7	mg/kg	95% H-UCL	ProUCL 4.0
	Manganese	mg/kg	548.5	599	909	599	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Mercury	mg/kg	0.0634	0.122	0.31	0.122	mg/kg	95% Chebyshev (Mean,Sd) UCL	ProUCL 4.0
	Vanadium	mg/kg	28.23	32.03	55.3	32.03	mg/kg	95% Student's t UCL	ProUCL 4.0
	Zinc	mg/kg	118.9	145.7	337	145.7	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Heptachlor Epoxide	mg/kg	0.0088	0.023	0.11	0.023	mg/kg	95% UCL (Bounding)	FOD < 5%
	4,4'-DDT	mg/kg	0.0107	0.0075	0.026	0.0075	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Aroclor 1254	mg/kg	0.0997	0.069	0.2	0.069	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Aroclor 1260	mg/kg	0.011	0.02	0.078	0.02	mg/kg	95% UCL (Bounding)	FOD < 5%
	Acenaphthene	mg/kg	0.344	0.51	1.6	0.51	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Acenaphthylene	mg/kg	0.290	0.211	1.10	0.211	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Benzo(b)fluoranthene	mg/kg	0.0269	0.0266	0.11	0.0266	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Chrysene	mg/kg	0.0386	0.0475	0.21	0.0475	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Indeno(1,2,3-cd)pyrene	mg/kg	0.113	0.082	0.39	0.082	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Naphthalene	mg/kg	1.99	7.32	9.4	7.32	mg/kg	99% KM (Chebyshev) UCL	ProUCL 4.0
	Phenanthrene	mg/kg	0.0426	0.0362	0.12	0.0362	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Pyrene	mg/kg	0.0462	0.0554	0.18	0.0554	mg/kg	95% KM (percentile bootstrap) UCL	ProUCL 4.0
	1,3,5-Trinitrobenzene	mg/kg	0.55	1.32	7.6	1.32	mg/lkg	95% UCL (Bounding)	FOD < 5%
	2,4,6-Trinitrotoluene	mg/kg	33.7	13.6	130	13.6	mg/lkg	95% KM (t) UCL	ProUCL 4.0
	2,4-Dinitrotoluene	mg/kg	0.66	1.65	17	1.65	mg/lkg	95% UCL (Bounding)	FOD < 5%
	2,6-Dinitrotoluene	mg/kg	0.49	1.13	11	1.13	mg/lkg	95% UCL (Bounding)	FOD < 5%
	2-Amino-4,6-Dinitrotoluene	mg/kg	0.30	0.63	5.7	0.63	mg/lkg	95% UCL (Bounding)	FOD < 5%
	4-Amino-2,6-Dinitrotoluene	mg/kg	0.26	0.56	5.2	0.56	mg/lkg	95% UCL (Bounding)	FOD < 5%
	HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	mg/kg	0.32	0.71	6.8	0.71	mg/lkg	95% UCL (Bounding)	FOD < 5%
	2,3,7,8-TCDD TEQ Mammalian	mg/kg	2.76E-06	9.59E-06	1.70E-05	9.59E-06	mg/kg	95% Adjusted Gamma UCL	ProUCL 4.0
	2,3,7,8-TCDD TEQ Avian	mg/kg	2.73E-06	1.16E-05	1.70E-05	1.68E-05	mg/kg	95% Adjusted Gamma UCL	ProUCL 4.0

Notes:
FOD = frequency of detection
For FOD of 100% to 5%, ProUCL 4.0 was used.
For FOD of <5%, bounding was used.
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram

Table F.2-5
Plant Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TAL Metals			
Aluminum	7429-90-5	50	ORNL-Plants
Antimony	7440-36-0	5	ORNL-Plants
Arsenic	7440-38-2	18	ECO SSL
Barium	7440-39-3	500	ORNL-Plants
Beryllium	7440-41-7	10	ORNL-Plants
Cadmium	7440-43-9	32	ECO SSL
Calcium	7440-70-2	4	ORNL-Plants
Chromium	7440-47-3	1	ORNL-Plants
Cobalt	7440-48-4	13	ECO SSL
Copper	7440-50-8	70	ECO SSL
Iron	7439-89-6	NV	--
Lead	7439-92-1	120	ECO SSL
Magnesium	7439-95-4	NV	--
Manganese	7439-96-5	500	ORNL-Plants
Mercury	7439-97-6	0.3	ORNL-Plants
Nickel	7440-02-0	38	ECO SSL
Potassium	7440-09-7	NV	--
Selenium	7782-49-2	1	ORNL-Plants
Silver	7440-22-4	560	ECO SSL
Sodium	7440-23-5	NV	--
Thallium	7440-28-0	1	ORNL-Plants
Vanadium	7440-62-2	2	ORNL-Plants
Zinc	7440-66-6	50	ORNL-Plants
TCL Pesticides/PCBs			
4,4'-DDE	72-55-9	0.1	BTAG - Flora
4,4'-DDT	50-29-3	0.1	BTAG - Flora
alpha-Chlordane [1]	5103-71-9	0.1	BTAG - Flora
delta-BHC	319-86-8	100	BTAG - Flora
Endosulfan Sulfate	1031-07-8	NV	--
Endrin Aldehyde	7421-93-4	0.1	BTAG - Flora
gamma-BHC (Lindane)	58-89-9	0.1	BTAG - Flora
gamma-Chlordane [1]	5103-74-2	0.1	BTAG - Flora
Heptachlor	76-44-8	0.1	BTAG - Flora
Heptachlor epoxide	1024-57-3	0.1	BTAG - Flora
Methoxychlor	72-43-5	0.1	BTAG - Flora
Aroclor 1254	11097-69-1	NV	--
Aroclor 1260	11096-82-5	NV	--
TCL SVOCs			
2-Nitroaniline	88-74-4	NV	--
Bis(2-ethylhexyl)phthalate	117-81-7	NV	--
Di-n-butylphthalate	84-74-2	200	ORNL-Plants
Di-n-octylphthalate	117-84-0	NV	--
Diethylphthalate	84-66-2	NV	--
N-Nitrosodiphenylamine	86-30-6	NV	--

Table F.2-5
Plant Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
PAHs			
Acenaphthene	83-32-9	0.1	BTAG - Flora
Acenaphthylene	208-96-8	0.1	BTAG - Flora
Benzo(a)anthracene	56-55-3	0.1	BTAG - Flora
Benzo(a)pyrene	50-32-8	0.1	BTAG - Flora
Benzo(b)fluoranthene	205-99-2	0.1	BTAG - Flora
Benzo(g,h,i)perylene	191-24-2	0.1	BTAG - Flora
Benzo(k)fluoranthene	207-08-9	0.1	BTAG - Flora
Chrysene	218-01-9	0.1	BTAG - Flora
Dibenz(a,h)anthracene	53-70-3	0.1	BTAG - Flora
Fluoranthene	206-44-0	0.1	BTAG - Flora
Indeno(1,2,3-cd)pyrene	193-39-5	0.1	BTAG - Flora
Naphthalene	91-20-3	0.1	BTAG - Flora
Phenanthrene	85-01-8	0.1	BTAG - Flora
Pyrene	129-00-0	0.1	BTAG - Flora
Explosives			
1,3,5-Trinitrobenzene	99-35-4	8.6	Kuperman 2003
2,4,6-Trinitrotoluene	118-96-7	2.4	Best et al. 2004
2,4-Dinitrotoluene	121-14-2	5.3	Kuperman 2003
2,6-Dinitrotoluene	606-20-2	4.5	Kuperman 2003
2-Amino-4,6-Dinitrotoluene	355-72-78-2	80	Pennington 1988
4-Amino-2,6-Dinitrotoluene	1946-51-0	80	Pennington 1988
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	2691-41-0	NV	--

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
NV = No Value Available
USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
ORNL - Plants - Toxilogical Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision Efroymson et al.)
BTAG - Flora - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
[1] = Chlordane BTAG Screening Level Used
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon

Best, E.P.H., H.E. Tatem, K.N. Geter, M.L. Wells and B.K. Lane. 2004. Toxicity and Metabolites of 2,4,6 Trinitrotoluene (TNT) in Plants and Worms from Exposure to Aged Soil. U.S. Army Corps of Engineers, Engineer Research and Development Center. ERDC/EL TR-04-18.

Kuperman. R. 2003. Development of Ecological Toxicity and Biomagnification Data for Explosives Contaminants in Soil. U.S. Army Edgewood Chemical Biological Center. Final Techinical Report. Project CU-1221.

Pennington, Judith C. 1988. Plant Uptake of 2,4,6-Trinitrotoluene, 4-Amino-2,6-Dinitrotoluene, and 2-Amino-4,6-Dinitrotoluene Using 14C-Labeled and Unlabeled Compounds. ADA203690.

Table F.2-6
Plant Screening - Soil
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Inorganics						
Aluminum	7429-90-5	19,400	50	**3.9E+02**	12,632	**2.5E+02**
Antimony	7440-36-0	0.76	5	1.5E-01	NC	NC
Arsenic	7440-38-2	2.5	18	1.4E-01	NC	NC
Barium	7440-39-3	206	500	4.1E-01	NC	NC
Beryllium	7440-41-7	1	10	1.0E-01	NC	NC
Cadmium	7440-43-9	1.6	32	5.0E-02	NC	NC
Calcium	7440-70-2	21,500	4	**5.4E+03**	6,615	**1.7E+03**
Chromium	7440-47-3	29.5	1	**3.0E+01**	20.5	**2.1E+01**
Cobalt	7440-48-4	16	13	**1.2E+00**	8.9	6.8E-01
Copper	7440-50-8	84.1	70	**1.2E+00**	20.1	2.9E-01
Iron	7439-89-6	27,200	NV	NC	NC	NC
Lead	7439-92-1	528	120	**4.4E+00**	110.7	9.2E-01
Magnesium	7439-95-4	5,000	NV	NC	NC	NC
Manganese	7439-96-5	909	500	**1.8E+00**	599	**1.2E+00**
Mercury	7439-97-6	0.31	0.3	**1.0E+00**	0.122	4.1E-01
Nickel	7440-02-0	13.5	38	3.6E-01	NC	NC
Potassium	7440-09-7	1,810	NV	NC	NC	NC
Selenium	7782-49-2	2	1	**2.0E+00**	1.134	**1.1E+00**
Silver	7440-22-4	0.89	560	1.6E-03	NC	NC
Sodium	7440-23-5	469	NV	NC	NC	NC
Thallium	7440-28-0	0.2	1	2.0E-01	NC	NC
Vanadium	7440-62-2	55.3	2	**2.8E+01**	32.03	**1.6E+01**
Zinc	7440-66-6	337	50	**6.7E+00**	145.7	**2.9E+00**
TCL Pesticides/PCBs						
4,4'-DDE	72-55-9	0.0048	0.1	4.8E-02	NC	NC
4,4'-DDT	50-29-3	0.026	0.1	2.6E-01	NC	NC
alpha-Chlordane	5103-71-9	0.0031	0.1	3.1E-02	NC	NC
delta-BHC	319-86-8	0.0005	100	5.0E-06	NC	NC
Endosulfan Sulfate	1031-07-8	0.0018	NV	NC	NC	NC
Endrin Aldehyde	7421-93-4	0.0012	0.1	1.2E-02	NC	NC
gamma-BHC (Lindane)	58-89-9	0.0016	0.1	1.6E-02	NC	NC
gamma-Chlordane	5103-74-2	0.01	0.1	1.0E-01	NC	NC
Heptachlor	76-44-8	0.0048	0.1	4.8E-02	NC	NC
Heptachlor epoxide	1024-57-3	0.11	0.1	**1.1E+00**	0.023	2.3E-01
Methoxychlor	72-43-5	0.0074	0.1	7.4E-02	NC	NC
Aroclor 1254	11097-69-1	0.2	NV	NC	NC	NC
Aroclor 1260	11096-82-5	0.078	NV	NC	NC	NC
TCL SVOCs						
2-Nitroaniline	88-74-4	0.055	NV	NC	NC	NC
Bis(2-ethylhexyl)phthalate	117-81-7	2.6	NV	NC	NC	NC
Di-n-butylphthalate	84-74-2	0.8	200	4.0E-03	NC	NC
Di-n-octylphthalate	117-84-0	0.32	NV	NC	NC	NC
Diethylphthalate	84-66-2	0.68	NV	NC	NC	NC
N-Nitrosodiphenylamine	86-30-6	1.2	NV	NC	NC	NC
PAHs						
Acenaphthene	83-32-9	1.6	0.1	**1.6E+01**	0.51	**5.1E+00**
Acenaphthylene	208-96-8	1.1	0.1	**1.1E+01**	0.211	**2.1E+00**
Benzo(a)anthracene	56-55-3	0.049	0.1	4.9E-01	NC	NC
Benzo(a)pyrene	50-32-8	0.058	0.1	5.8E-01	NC	NC
Benzo(b)fluoranthene	205-99-2	0.11	0.1	**1.1E+00**	0.0266	2.7E-01
Benzo(g,h,i)perylene	191-24-2	0.032	0.1	3.2E-01	NC	NC
Benzo(k)fluoranthene	207-08-9	0.057	0.1	5.7E-01	NC	NC
Chrysene	218-01-9	0.21	0.1	**2.1E+00**	0.0475	4.8E-01
Dibenz(a,h)anthracene	53-70-3	0.036	0.1	3.6E-01	NC	NC
Fluoranthene	206-44-0	0.09	0.1	9.0E-01	NC	NC
Indeno(1,2,3-cd)pyrene	193-39-5	0.39	0.1	**3.9E+00**	0.082	8.2E-01
Naphthalene	91-20-3	9.4	0.1	**9.4E+01**	7.32	**7.3E+01**

Table F.2-6
Plant Screening - Soil
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Phenanthrene	85-01-8	0.12	0.1	**1.2E+00**	0.0362	3.6E-01
Pyrene	129-00-0	0.18	0.1	**1.8E+00**	0.0554	5.5E-01
Explosives						
1,3,5-Trinitrobenzene	99-35-4	7.6	8.6	8.8E-01	NC	NC
2,4,6-Trinitrotoluene	118-96-7	130	2.4	**5.4E+01**	13.6	**5.7E+00**
2,4-Dinitrotoluene	121-14-2	17	5.3	**3.2E+00**	1.65	3.1E-01
2,6-Dinitrotoluene	606-20-2	11	4.5	**2.4E+00**	1.13	2.5E-01
2-Amino-4,6-Dinitrotoluene	355-72-78-2	5.7	80	7.1E-02	NC	NC
4-Amino-2,6-Dinitrotoluene	1946-51-0	5.2	80	6.5E-02	NC	NC
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	2691-41-0	6.8	NV	NC	NC	NC

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
VOC = Volatile Organic Compound
NV = No Value Available
NC = Not Calculated
Hazard Quotient = Soil Concentration/Screening Level
EPC = Exposure Point Concentration

Table F.2-7
Invertebrate and Microbial Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TAL Metals			
Aluminum	7429-90-5	NV	--
Antimony	7440-36-0	78	ECO SSL
Arsenic	7440-38-2	60	ORNL-Earthworm
Barium	7440-39-3	330	ECO SSL
Beryllium	7440-41-7	40	ECO SSL
Cadmium	7440-43-9	140	ECO SSL
Calcium	7440-70-2	NV	--
Chromium	7440-47-3	0.4	ORNL-Earthworm
Cobalt	7440-48-4	200	BTAG - Fauna
Copper	7440-50-8	80	ECO SSL
Iron	7439-89-6	200	ORNL - Microbial
Lead	7439-92-1	1,700	ECO SSL
Magnesium	7439-95-4	NV	--
Manganese	7439-96-5	100	ORNL - Microbial
Mercury	7439-97-6	0.1	ORNL-Earthworm
Nickel	7440-02-0	280	ECO SSL
Potassium	7440-09-7	NV	--
Selenium	7782-49-2	70	ORNL-Earthworm
Silver	7440-22-4	50	ORNL - Microbial
Sodium	7440-23-5	NV	--
Thallium	7440-28-0	NV	--
Vanadium	7440-62-2	20	ORNL - Microbial
Zinc	7440-66-6	100	ORNL-Earthworm
TCL Pesticides/PCBs			
4,4'-DDE	72-55-9	0.1	BTAG - Fauna
4,4'-DDT	50-29-3	0.1	BTAG - Fauna
alpha-Chlordane [1]	5103-71-9	0.1	BTAG - Fauna
delta-BHC	319-86-8	NV	--
Endosulfan Sulfate	1031-07-8	NV	--
Endrin Aldehyde	7421-93-4	0.1	BTAG - Fauna
gamma-BHC (Lindane)	58-89-9	0.1	BTAG - Fauna
gamma-Chlordane [1]	5103-74-2	0.1	BTAG - Fauna
Heptachlor	76-44-8	0.1	BTAG - Fauna
Heptachlor epoxide	1024-57-3	0.1	BTAG - Fauna
Methoxychlor	72-43-5	0.1	BTAG - Fauna
Aroclor 1254	11097-69-1	NV	--
Aroclor 1260	11096-82-5	NV	--
TCL SVOCs			
2-Nitroaniline	88-74-4	NV	--
Bis(2-ethylhexyl)phthalate	117-81-7	NV	--
Di-n-butylphthalate	84-74-2	NV	--
Di-n-octylphthalate	117-84-0	NV	--
Diethylphthalate	84-66-2	NV	--
N-Nitrosodiphenylamine	86-30-6	NV	--

Table F.2-7
Invertebrate and Microbial Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
PAHs			
Acenaphthene	83-32-9	0.1	BTAG - Fauna
Acenaphthylene	208-96-8	0.1	BTAG - Fauna
Benzo(a)anthracene	56-55-3	0.1	BTAG - Fauna
Benzo(a)pyrene	50-32-8	NV	--
Benzo(b)fluoranthene	205-99-2	0.1	BTAG - Fauna
Benzo(g,h,i)perylene	191-24-2	0.1	BTAG - Fauna
Benzo(k)fluoranthene	207-08-9	0.1	BTAG - Fauna
Chrysene	218-01-9	0.1	BTAG - Fauna
Dibenz(a,h)anthracene	53-70-3	0.1	BTAG - Fauna
Fluoranthene	206-44-0	0.1	BTAG - Fauna
Indeno(1,2,3-cd)pyrene	193-39-5	0.1	BTAG - Fauna
Naphthalene	91-20-3	0.1	BTAG - Fauna
Phenanthrene	85-01-8	0.1	BTAG - Fauna
Pyrene	129-00-0	0.1	BTAG - Fauna
Explosives			
1,3,5-Trinitrobenzene	99-35-4	18.1	Kuperman 2003
2,4,6-Trinitrotoluene	118-96-7	1.2	Best et al. 2004
2,4-Dinitrotoluene	121-14-2	19.8	Kuperman 2003
2,6-Dinitrotoluene	606-20-2	6.9	Kuperman 2003
2-Amino-4,6-Dinitrotoluene	355-72-78-2	NV	--
4-Amino-2,6-Dinitrotoluene	1946-51-0	NV	--
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	2691-41-0	6.3	Kuperman 2003

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
NV = No Value Available
USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
ORNL - Earthworms - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
ORNL - Microbial Processes - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
BTAG - Fauna - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
[1] = Chlordane BTAG Screening Level Used
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon

Best, E.P.H., H.E. Tatem, K.N. Geter, M.L. Wells and B.K. Lane. 2004. Toxicity and Metabolites of 2,4,6 Trinitrotoluene (TNT) in Plants and Worms from Exposure to Aged Soil. U.S. Army Corps of Engineers, Engineer Research and Development Center. ERDC/EL TR-04-18.
Kuperman. R. 2003. Development of Ecological Toxicity and Biomagnification Data for Explosives Contaminants in Soil. U.S. Army Edgewood Chemical Biological Center. Final Techinical Report. Project CU-1221.

Table F.2-8
Invertebrate and Microbial Screening - Soil
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Inorganics						
Aluminum	7429-90-5	19,400	NV	NC	NC	NC
Antimony	7440-36-0	0.76	78	9.7E-03	NC	NC
Arsenic	7440-38-2	2.5	60	4.2E-02	NC	NC
Barium	7440-39-3	206	330	6.2E-01	NC	NC
Beryllium	7440-41-7	1	40	2.5E-02	NC	NC
Cadmium	7440-43-9	1.6	140	1.1E-02	NC	NC
Calcium	7440-70-2	21,500	NV	NC	NC	NC
Chromium	7440-47-3	29.5	0.4	**7.4E+01**	20.5	**5.1E+01**
Cobalt	7440-48-4	16	200	8.0E-02	NC	NC
Copper	7440-50-8	84.1	80	**1.1E+00**	20.1	2.5E-01
Iron	7439-89-6	27,200	200	**1.4E+02**	20,416	**1.0E+02**
Lead	7439-92-1	528	1,700	3.1E-01	NC	NC
Magnesium	7439-95-4	5,000	NV	NC	NC	NC
Manganese	7439-96-5	909	100	**9.1E+00**	599	**6.0E+00**
Mercury	7439-97-6	0.31	0.1	**3.1E+00**	0.122	**1.2E+00**
Nickel	7440-02-0	13.5	280	4.8E-02	NC	NC
Potassium	7440-09-7	1,810	NV	NC	NC	NC
Selenium	7782-49-2	2	70	2.9E-02	NC	NC
Silver	7440-22-4	0.89	50	1.8E-02	NC	NC
Sodium	7440-23-5	469	NV	NC	NC	NC
Thallium	7440-28-0	0.2	NV	NC	NC	NC
Vanadium	7440-62-2	55.3	20	**2.8E+00**	32.03	**1.6E+00**
Zinc	7440-66-6	337	100	**3.4E+00**	145.7	**1.5E+00**
TCL Pesticides/PCBs						
4,4'-DDE	72-55-9	0.0048	0.1	4.8E-02	NC	NC
4,4'-DDT	50-29-3	0.026	0.1	2.6E-01	NC	NC
alpha-Chlordane	5103-71-9	0.0031	0.1	3.1E-02	NC	NC
delta-BHC	319-86-8	0.0005	NV	NC	NC	NC
Endosulfan Sulfate	1031-07-8	0.0018	NV	NC	NC	NC
Endrin Aldehyde	7421-93-4	0.0012	0.1	1.2E-02	NC	NC
gamma-BHC (Lindane)	58-89-9	0.0016	0.1	1.6E-02	NC	NC
gamma-Chlordane	5103-74-2	0.01	0.1	1.0E-01	NC	NC
Heptachlor	76-44-8	0.0048	0.1	4.8E-02	NC	NC
Heptachlor epoxide	1024-57-3	0.11	0.1	**1.1E+00**	0.023	2.3E-01
Methoxychlor	72-43-5	0.0074	0.1	7.4E-02	NC	NC
Aroclor 1254	11097-69-1	0.2	NV	NC	NC	NC
Aroclor 1260	11096-82-5	0.078	NV	NC	NC	NC
TCL SVOCs						
2-Nitroaniline	88-74-4	0.055	NV	NC	NC	NC
Bis(2-ethylhexyl)phthalate	117-81-7	2.6	NV	NC	NC	NC
Di-n-butylphthalate	84-74-2	0.8	NV	NC	NC	NC
Di-n-octylphthalate	117-84-0	0.32	NV	NC	NC	NC
Diethylphthalate	84-66-2	0.68	NV	NC	NC	NC
N-Nitrosodiphenylamine	86-30-6	1.2	NV	NC	NC	NC
PAHs						
Acenaphthene	83-32-9	1.6	0.1	**1.6E+01**	0.51	**5.1E+00**
Acenaphthylene	208-96-8	1.1	0.1	**1.1E+01**	0.211	**2.1E+00**
Benzo(a)anthracene	56-55-3	0.049	0.1	4.9E-01	NC	NC
Benzo(a)pyrene	50-32-8	0.058	NV	NC	NC	NC
Benzo(b)fluoranthene	205-99-2	0.11	0.1	**1.1E+00**	0.0266	2.7E-01
Benzo(g,h,i)perylene	191-24-2	0.032	0.1	3.2E-01	NC	NC
Benzo(k)fluoranthene	207-08-9	0.057	0.1	5.7E-01	NC	NC
Chrysene	218-01-9	0.21	0.1	**2.1E+00**	0.0475	4.8E-01
Dibenz(a,h)anthracene	53-70-3	0.036	0.1	3.6E-01	NC	NC
Fluoranthene	206-44-0	0.09	0.1	9.0E-01	NC	NC
Indeno(1,2,3-cd)pyrene	193-39-5	0.39	0.1	**3.9E+00**	0.082	8.2E-01
Naphthalene	91-20-3	9.4	0.1	**9.4E+01**	7.32	**7.3E+01**

Table F.2-8
Invertebrate and Microbial Screening - Soil
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Phenanthrene	85-01-8	0.12	0.1	**1.2E+00**	0.0362	3.6E-01
Pyrene	129-00-0	0.18	0.1	**1.8E+00**	0.0554	5.5E-01
Explosives						
1,3,5-Trinitrobenzene	99-35-4	7.6	18.1	4.2E-01	NC	NC
2,4,6-Trinitrotoluene	118-96-7	130	1.2	**1.1E+02**	13.6	**1.1E+01**
2,4-Dinitrotoluene	121-14-2	17	19.8	8.6E-01	NC	NC
2,6-Dinitrotoluene	606-20-2	11	6.9	**1.6E+00**	1.13	1.6E-01
2-Amino-4,6-Dinitrotoluene	355-72-78-2	5.7	NV	NC	NC	NC
4-Amino-2,6-Dinitrotoluene	1946-51-0	5.2	NV	NC	NC	NC
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	2691-41-0	6.8	6.3	**1.1E+00**	0.71	1.1E-01

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
VOC = Volatile Organic Compound
NV = No Value Available
NC = Not Calculated
Hazard Quotient = Soil Concentration/Screening Level
EPC = Exposure Point Concentration

Table F.2-9
Wildlife Profiles
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

							Preliminary Assessment					Refined Assessment					
Representative Species			Composition of Diet [1] (%)				Minimum Body Weight [1]	Maximum Body Weight [1]	Maximum Food Ingestion Rate[2]	Maximum Substrate Ingestion Rate [3]		Average Body Weight [1]	Average Food Ingestion Rate [2]	Average Substrate Ingestion Rate [1]	Home Range (ha)	Proportion of Year Species Active	AUFs
Food-web Classification	Common Name	Scientific Name	Plants (incl. fungi)	Inverte-brates	Small mammals	Fish	kg	kg	kg dw/day	% of dry intake	kg dry wt./day	kg	kg dw/day	kg dry wt./day			Study Area (0.67) hectares
Birds																	
soil-probing invertivore	American robin	*Turdus migratorius*	62%	38%			0.0635	0.103	0.020	5%	0.001	0.077	0.016	0.0008	0.48	1	1.00
large carnivore	Red-tailed hawk	*Buteo jamaicensis*			100%		0.957	1.235	0.063	0%	0	1.134	0.059	0	250	1	0.0027
Mammals																	
small herbivore	Meadow vole	*Microtus pennsylvanicus*	100%				0.017	0.0524	0.010	2.4%	0.00024	0.037	0.008	0.00019	0.037	1	1
medium carnivore	Red fox	*Vulpes vulpes*	17%	4%	79%		2.95	7.04	0.342	2.8%	0.0096	4.53	0.238	0.0067	96	1	0.0070
small invertivore	Short-tailed shrew	*Blarina brevicauda*	14%	86%			0.0125	0.0225	0.003	13%	0.00039	0.015	0.002	0.00026	0.39	1	1.00

Notes:
kg = Kilogram
kg dw/day = Kilogram Dry-weight per Day
L/day = Liter per Day

[1]Wildlife Exposure Factors Handbook. U.S. Environmental Protection Agency (EPA). 1993. Office of Research and Development. 2 Volumes. EPA/600/R93/187a&b. December.
[2] Estimated food intake rate (kg [dw]/day) calculated as follows:
FI ((kg/day) = 0.0687 $Wt.^{0.882}$ for mammals (red fox and short-tailed shrew)
FI ((g/day) = 0.577 $Wt.^{0.727}$ for herbivores (meadow vole)
FI ((g/day) = 0.301 $Wt.^{0.751}$ for non-passerine birds (red-tailed hawk)
FI ((g/day) = 0.398 $Wt.^{0.850}$ for passerine birds (american robin)
[3]Estimating Exposure to Terrestrial Wildlife to Contaminants. Sample and Sutter. 1994. ES/ER/TM-125.
The soil ingestion rate for the american robin set equal to 38% of the american woodcock value (0.34*10.4%=4%), based on a robin diet of 38% invertbrates.

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Table F.2-10
Wildlife TRVs
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

	CAS #	AVIAN TEST SPECIES				MAMMALIAN TEST SPECIES					AVIAN RECEPTORS				MAMMALIAN RECEPTORS					
											American Robin		Red-tailed Hawk		Meadow Vole		Red Fox		Short-tailed Shrew	
		Chronic LOAEL	Chronic NOAEL	Test Animal	Source	Chronic LOAEL	Chronic NOAEL	Test Animal	Test Animal Body Weight (kg)	Source	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL
		(mg/kg-bw/d)				(mg/kg-bw/d)					(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)	
Arsenic	7440-38-2	12.84	5.14	mallard duck	ORNL 1996	1.26	0.126	mouse	0.03	ORNL 1996	1.28E+01	5.14E+00	1.28E+01	5.14E+00	1.20E+00	1.20E-01	3.59E-01	3.59E-02	1.50E+00	1.50E-01
Cadmium	7440-43-9	20	1.45	mallard duck	ORNL 1996	10	1	rat	0.3	ORNL 1996	2.00E+01	1.45E+00	2.00E+01	1.45E+00	1.69E+01	1.69E+00	5.07E+00	5.07E-01	2.11E+01	2.11E+00
Chromium	7440-47-3	5	1	black duck	ORNL 1996	32.8	3.28	rat	0.35	ORNL 1996	5.00E+00	1.00E+00	5.00E+00	1.00E+00	5.75E+01	5.75E+00	1.73E+01	1.73E+00	7.21E+01	7.21E+00
Copper	7440-50-8	61.7	47	1 day old chicks	ORNL 1996	15.4	11.7	mink	1	ORNL 1996	6.17E+01	4.70E+01	6.17E+01	4.70E+01	3.51E+01	2.67E+01	1.06E+01	8.02E+00	4.40E+01	3.34E+01
Lead	7439-92-1	11.3	1.13	Japanese quail	ORNL 1996	80	8	rat	0.35	ORNL 1996	1.13E+01	1.13E+00	1.13E+01	1.13E+00	1.40E+02	1.40E+01	4.22E+01	4.22E+00	1.76E+02	1.76E+01
Mercury	7439-97-6	0.9	0.45	Japanese Quail	ORNL 1996	132	13.2	mink	1	ORNL 1996	9.00E-01	4.50E-01	9.00E-01	4.50E-01	3.01E+02	3.01E+01	9.05E+01	9.05E+00	3.77E+02	3.77E+01
Nickel	7440-02-0	107	77.4	mallard duckling	ORNL 1996	80	40	rat	0.35	ORNL 1996	1.07E+02	7.74E+01	1.07E+02	7.74E+01	1.40E+02	7.01E+01	4.22E+01	2.11E+01	1.76E+02	8.79E+01
Selenium	7782-49-2	0.8	0.4	mallard duck	ORNL 1996	0.33	0.2	rat	0.35	ORNL 1996	8.00E-01	4.00E-01	8.00E-01	4.00E-01	5.79E-01	3.51E-01	1.74E-01	1.05E-01	7.25E-01	4.40E-01
Silver	7440-22-4	124.2	16.56	turkey	Matuk et al. 1981	222	22.2	rat	0.35	Matuk et al. 1981	1.24E+02	1.66E+01	1.24E+02	1.66E+01	3.89E+02	3.89E+01	1.17E+02	1.17E+01	4.88E+02	4.88E+01
Zinc	7440-66-6	131	14.5	white leghorn hen	ORNL 1996	320	160	rat	0.35	ORNL 1996	1.31E+02	1.45E+01	1.31E+02	1.45E+01	5.61E+02	2.81E+02	1.69E+02	8.44E+01	7.03E+02	3.52E+02
PAHs																				
Acenaphthene	83-32-9	5.05	1.01	red-winged blackbird	USACE 1998	87.5	17.5	mouse	0.03	USACE 1998	5.05E+00	1.01E+00	5.05E+00	1.01E+00	8.30E+01	1.66E+01	2.50E+01	4.99E+00	1.04E+02	2.08E+01
Acenaphthylene	208-96-8	--	--	--	USACE 1998	500	100	rat	0.35	USACE 1998	NV	NV	NV	NV	8.77E+02	1.75E+02	2.64E+02	5.27E+01	1.10E+03	2.20E+02
Benzo(a)anthracene	56-55-3	--	--	--	USACE 1998	2	0.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	2.91E+00	2.91E-01	8.74E-01	8.74E-02	3.64E+00	3.64E-01
Benzo(a)pyrene	50-32-8	2.5	0.5	duck	ORNL 1996	10	1	mouse	0.03	ORNL 1996	2.50E+00	5.00E-01	2.50E+00	5.00E-01	9.49E+00	9.49E-01	2.85E+00	2.85E-01	1.19E+01	1.19E+00
Benzo(b)fluoranthene	205-99-2	--	--	--	ORNL 1996	10	1	mouse	0.03	ORNL 1996	NV	NV	NV	NV	9.49E+00	9.49E-01	2.85E+00	2.85E-01	1.19E+01	1.19E+00
Benzo(g,h,i)perylene	191-24-2	--	--	--	USACE 1998	2.5	0.5	mouse	0.03	USACE 1998	NV	NV	NV	NV	2.37E+00	4.74E-01	7.13E-01	1.43E-01	2.97E+00	5.95E-01
Benzo(k)fluoranthene	207-08-9	--	--	--	USACE 1998	72	7.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.05E+02	1.05E+01	3.15E+01	3.15E+00	1.31E+02	1.31E+01
Chrysene	218-01-9	--	--	--	USACE 1998	99	9.9	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.44E+02	1.44E+01	4.32E+01	4.32E+00	1.80E+02	1.80E+01
Dibenzo(a,h)anthracene	53-70-3	--	--	--	USACE 1998	13.33	1.333	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.94E+01	1.94E+00	5.82E+00	5.82E-01	2.43E+01	2.43E+00
Fluoranthene	206-44-0	--	--	--	USACE 1998	100	20	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.45E+02	2.91E+01	4.37E+01	8.74E+00	1.82E+02	3.64E+01
Indeno(1,2,3-cd)pyrene	193-39-5	--	--	--	USACE 1998	72	7.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.05E+02	1.05E+01	3.15E+01	3.15E+00	1.31E+02	1.31E+01
Phenanthrene	85-01-8	5.65	1.13	red-winged blackbird	USACE 1998	35	7	mouse	0.03	USACE 1998	5.65E+00	1.13E+00	5.65E+00	1.13E+00	3.32E+01	6.64E+00	9.98E+00	2.00E+00	4.16E+01	8.32E+00
Pyrene	129-00-0	--	--	--	USACE 1998	40	8	mouse	0.03	USACE 1998	NV	NV	NV	NV	3.80E+01	7.59E+00	1.14E+01	2.28E+00	4.76E+01	9.51E+00
Pesticides																				
4,4'-DDE	72-55-9	0.58	0.058	mallard duck	Kornbrust et al. 1986	230	23	rat	0.35	Kornbrust et al. 1986	5.80E-01	5.80E-02	5.80E-01	5.80E-02	4.03E+02	4.03E+01	1.21E+02	1.21E+01	5.06E+02	5.06E+01
4,4'-DDT	50-29-3	0.028	0.0028	brown pelican	ORNL 1996	4	0.8	rat	0.35	ORNL 1996	2.80E-02	2.80E-03	2.80E-02	2.80E-03	7.01E+00	1.40E+00	2.11E+00	4.22E-01	8.79E+00	1.76E+00
alpha-Chlordane	5103-71-9	10.7	2.14	red-winged blackbird	Chlordane Value	3.9	0.39	mouse	0.03	ATSDR 1994	1.07E+01	2.14E+00	1.07E+01	2.14E+00	3.70E+00	3.70E-01	1.11E+00	1.11E-01	4.64E+00	4.64E-01
delta-BHC	319-86-8	2.25	0.56	Japanese quail	ORNL 1996	0.14	0.014	mink	1	ORNL 1996	2.25E+00	5.60E-01	2.25E+00	5.60E-01	3.19E-01	3.19E-02	9.60E-02	9.60E-03	4.00E-01	4.00E-02
Endosulfan sulfate	1031-07-8	100	10	gray partridge	Endosulfan Value	0.26	0.026	mouse	0.35	Endosulfan Value	1.00E+02	1.00E+01	1.00E+02	1.00E+01	4.56E-01	4.56E-02	1.37E-01	1.37E-02	5.71E-01	5.71E-02
Endrin aldehyde	7421-93-4	0.17	0.028	mallard duck	Endrin Value	0.92	0.092	mouse	0.03	Endrin Value	1.70E-01	2.80E-02	1.70E-01	2.80E-02	8.73E-01	8.73E-02	2.62E-01	2.62E-02	1.09E+00	1.09E-01
gamma-BHC	58-89-9	20	2	mallard duck	ORNL 1996	80	8	rat	0.35	ORNL 1996	2.00E+01	2.00E+00	2.00E+01	2.00E+00	1.40E+02	1.40E+01	4.22E+01	4.22E+00	1.76E+02	1.76E+01
gamma-Chlordane	5103-74-2	10.6	2.14	red-winged blackbird	Chlordane Value	3.9	0.39	mouse	0.03	ATSDR 1994	1.06E+01	2.14E+00	1.06E+01	2.14E+00	3.70E+00	3.70E-01	1.11E+00	1.11E-01	4.64E+00	4.64E-01
Heptachlor	76-44-8	12.5	2.5	pheasant	ORNL 1996	1	0.1	mink	1	ORNL 1996	1.25E+01	2.50E+00	1.25E+01	2.50E+00	2.28E+00	2.28E-01	6.85E-01	6.85E-02	2.86E+00	2.86E-01
Heptachlor epoxide	1024-57-3	4.95	0.99	Japanese quail	USACE 1998	0.25	0.025	rat	0.35	USACE 1998	4.95E+00	9.90E-01	4.95E+00	9.90E-01	4.38E-01	4.38E-02	1.32E-01	1.32E-02	5.49E-01	5.49E-02
Methoxychlor	72-43-5	145	14.5	adult chicken	ORNL 1996	8	4	rat	0.35	ORNL 1996	1.45E+02	1.45E+01	1.45E+02	1.45E+01	1.40E+01	7.01E+00	4.22E+00	2.11E+00	1.76E+01	8.79E+00
PCBs																				
Aroclor 1254	11097-69-1	4.1	0.41	screech owl	Aroclor 1242 Value	0.68	0.068	oldfield mouse	0.03	ORNL 1996	4.10E+00	4.10E-01	4.10E+00	4.10E-01	6.45E-01	6.45E-02	1.94E-01	1.94E-02	8.09E-01	8.09E-02
Aroclor 1260	11096-82-5	4.1	0.41	screech owl	Aroclor 1242 Value	0.68	0.068	oldfield mouse	0.03	ORNL 1996	4.10E+00	4.10E-01	4.10E+00	4.10E-01	6.45E-01	6.45E-02	1.94E-01	1.94E-02	8.09E-01	8.09E-02
Explosives																				
1,3,5-Trinitrobenzene[4]	99-35-4	--	--	--	--	13.31	2.68	Rat	0.325	USCHPPM 2001a	NV	NV	NV	NV	2.29E+01	4.61E+00	6.89E+00	1.39E+00	2.87E+01	5.78E+00
2,4,6-Trinitrotoluene[5,7]	118-96-7	1.8	0.07	Northern Bobwhite	USCHPPM 2001b	8	2	Dog (beagle)	14	USCHPM 2001b (Levine et al. 1990)	1.80E+00	7.00E-02	1.80E+00	7.00E-02	3.53E+01	8.82E+00	1.06E+01	2.65E+00	4.42E+01	1.11E+01
2,4-Dinitrotoluene[1]	121-14-2	1.25	0.1	Northern Bobwhite	Johnson et al. 2005a	--	--	--	--	--	1.25E+00	1.00E-01	1.25E+00	1.00E-01	NV	NV	NV	NV	NV	NV
2,6-Dinitrotoluene[2]	606-20-2	1.25	0.1	Northern Bobwhite	Johnson et al. 2005a	--	--	--	--	--	1.25E+00	1.00E-01	1.25E+00	1.00E-01	NV	NV	NV	NV	NV	NV
2-Amino-4,6-dinitrotoluene[4]	355-72-78-2	--	--	--	--	48	9	Rat	0.325	USCHPPM 2005	NV	NV	NV	NV	8.26E+01	1.55E+01	2.48E+01	4.66E+00	1.04E+02	1.94E+01
4-Amino-2,6-dinitrotoluene[4]	1946-51-0	--	--	--	--	48	9	Rat	0.325	USCHPPM 2005	NV	NV	NV	NV	8.26E+01	1.55E+01	2.48E+01	4.66E+00	1.04E+02	1.94E+01
HMX[6]	2691-41-0	--	--	--	--	62.5	9	Mouse	0.035	USCHPPM 2001c	NV	NV	NV	NV	6.16E+01	8.88E+00	1.85E+01	2.67E+00	7.72E+01	1.11E+01
Dioxin/Furans																				
2,3,7,8-TCDD	1746-01-6	0.00014	0.000014	ring-necked pheasant	ORNL 1996	0.00001	0.000001	mouse	0.03	ORNL 1996	1.40E-04	1.40E-05	1.40E-04	1.40E-05	9.49E-06	9.49E-07	2.85E-06	2.85E-07	1.19E-05	1.19E-06

Table F.2-10
Wildlife TRVs
Screening Level Ecological Risk Assessment - Area A
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Radford Army Ammunition Plant, Radford, Virginia

Notes:

CAS = Chemical Abstract Service
TRV = Toxic Reference Value
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw/d = Body Weight Per Day
kg = kilogram
PAH = Polynuclear Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
USACE = U.S. Army Corps of Engineers
ORNL = Oak Ridge National Laboratory
LD_{50} = Lethal Dose for 50% of test organisms
NOAEL and LOAEL values were derived from acute values by applying an uncertainty factor of 150.

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[1] - Avian TRVs derived from subchronic NOAEL value of 1 and subchronic LOAEL value of 5 from a northern bobwhite and applying an uncertainty factor of 10 and 4 to derive NOAEL-based and LOAEL-based TRVs.
[2] - Used 2,4-dinitrotoluene avian TRVs as surrogate.
[3] - Avian chronic
[4]- Mature rat body weight (average male & female) = 0.325 kg (U.S. EPA, 1988).
[5]- Mature Bobwhite Body Weight (seasonal average) = 0.191 kg (U.S. EPA, 1993).
[6]- Mature mouse body weight (female) = 0.035 kg (U.S.EPA, 1988).
[7]- Mature dog body weight (average male & female) = 14 kg (U.S. EPA, 1988).

Table F.2-11
Soil Biocaccumulation/Bioconcentration Factors- Soil to Plant Pathway
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

					Preliminary Assessment		Refined Assessment			
Chemical	**CAS**	**Log K_{ow} Range**	**Selected K_{ow}**	**Source**	**BAF**	**Basis**	**C_s EPC (mg/kg)**	**BAF[1]**	**Basis**	**Source**
Inorganics										
ARSENIC	7440-38-2	-- - --	--	--	1.103	90th percentile	1.49	0.0375	Median	Bechtel Jacobs 1998
CADMIUM	7440-43-9	-- - --	--	--	3.25	90th percentile	0.44	0.9028	$C_p = e^{(0.546*ln(Cs) - 0.475)}$	Bechtel Jacobs 1998
CHROMIUM	7440-47-3	-- - --	--	--	0.084	90th percentile	20.50	0.0410	Median	Bechtel Jacobs 1998
COPPER	7440-50-8	-- - --	--	--	0.625	90th percentile	20.10	0.3165	$C_p = e^{(0.394*ln(Cs) + 0.668)}$	Bechtel Jacobs 1998
LEAD	7439-92-1	-- - --	--	--	0.468	90th percentile	110.70	0.0336	$C_p = e^{(0.561*ln(Cs) - 1.328)}$	Bechtel Jacobs 1998
MERCURY	7439-97-6	-- - --	--	--	5.0	90th percentile	0.12	0.9649	$C_p = e^{(0.544*ln(Cs) - 0.995)}$	Bechtel Jacobs 1998
NICKEL	7440-02-0	-- - --	--	--	1.411	90th percentile	NC	NC	$C_p = e^{(0.748*ln(Cs) + 2.223)}$	Bechtel Jacobs 1998
SELENIUM	7782-49-2	-- - --	--	--	3.012	90th percentile	1.13	0.5148	$C_p = e^{(1.104*ln(Cs) - 0.677)}$	Bechtel Jacobs 1998
SILVER	7440-22-4	-- - --	--	--	0.037	90th percentile	NC	0.0140	Median	Bechtel Jacobs 1998
ZINC	7440-66-6	-- - --	--	--	1.82	90th percentile	145.70	0.5237	$C_p = e^{(0.554*ln(Cs) + 1.575)}$	Bechtel Jacobs 1998
Pesticides										
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	0.08	Maximum	NC	NC	$C_p = e^{(0.752*ln(Cs) - 2.512)}$	USEPA 2005
4,4'-DDT	50-29-3	5.56 - 7.01	6.53	USEPA 1995	0.62	Maximum	0.01	0.2724	$C_p = e^{(0.752*ln(Cs) - 2.512)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	0.0086	K_{ow} Regression Eq.	Travis and Arms 1988
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	1	Default Value	NC	0.1653	K_{ow} Regression Eq.	Travis and Arms 1988
ENDOSULFAN SULFATE	1031-07-8	-- - --	--	--	1	Default Value	NC	0.2367	Endosulfan as Surrogate	--
ENDRIN ALDEHYDE	7421-93-4	-- - --	--	--	1	Default Value	NC	0.0461	Endrin as Surrogate	--
GAMMA-BHC (LINDANE)	58-89-9	3.61 - 3.9	3.73	USEPA 1995	1	Default Value	NC	0.2704	K_{ow} Regression Eq.	Travis and Arms 1988
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	0.0086	K_{ow} Regression Eq.	Travis and Arms 1988
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	1	Default Value	NC	0.0093	K_{ow} Regression Eq.	Travis and Arms 1988
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1	Default Value	0.02	0.0499	K_{ow} Regression Eq.	Travis and Arms 1988
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	1	Default Value	NC	0.0448	K_{ow} Regression Eq.	Travis and Arms 1988
PCBs										
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	0.0068	K_{ow} Regression Eq.	0.07	0.0068	K_{ow} Regression Eq.	Travis and Arms 1988
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	0.0045	K_{ow} Regression Eq.	0.02	0.0045	K_{ow} Regression Eq.	Travis and Arms 1988
VOCs and SVOCs										
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	4.6	Anthracene as Surrogate	0.51	0.0134	$C_p = e^{(-0.8556*ln(Cs) - 5.562)}$	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.1	USEPA 1995	4.6	Anthracene as Surrogate	0.21	0.4410	$C_p = e^{(0.791*ln(Cs) - 1.144)}$	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	0.54	Maximum	NC	NC	$C_p = e^{(0.5944*ln(Cs) - 2.708)}$	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	3.3	Maximum	0.02	0.1412	$C_p = e^{(0.975*ln(Cs) - 2.0615)}$	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	0.48	Maximum	0.03	0.31	Median BAF	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1.6	Maximum	NC	NC	$C_p = e^{(1.183*ln(Cs) - 0.931)}$	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	1.0	Maximum	NC	NC	$C_p = e^{(0.860*ln(Cs) - 2.158)}$	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	1.05	Maximum	0.05	0.2295	$C_p = e^{(0.594*ln(Cs) - 2.708)}$	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	0.23	Maximum	0.02	0.13	Median BAF	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	5.12	USEPA 1995	6.0	Maximum	NC	0.50	Median BAF	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.65	USEPA 1995	0.15	Maximum	0.08	0.11	Median BAF	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	11	Maximum	0.04	2.9850	$C_p = e^{(0.620*ln(Cs) - 0.167)}$	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	5.11	USEPA 1995	3.7	Maximum	0.06	0.72	Median BAF	USEPA 2005
Explosives										
1,3,5-TNB	99-35-4	-- - --	1.6	SRC	8.46	TNT as surrogate	1.32	4.23	TNT as surrogate	--
2,4-DNT	121-14-2	-- - --	1.6	SRC	8.46	TNT as surrogate	1.65	4.23	TNT as surrogate	--
2,6-DNT	606-20-2	-- - --	1.6	SRC	8.46	TNT as surrogate	1.13	4.23	TNT as surrogate	--
2,4,6-TNT	118-96-7	-- - --	1.6	SRC	8.46	Maximum	13.6	4.23	Median BAF	USEPA 2005
2-AMINO-4,6-DINITROTOLUENE	355-72-78-2	-- - --	1.6	SRC	8.46	TNT as surrogate	0.63	4.23	TNT as surrogate	--
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	-- - --	1.6	SRC	8.46	TNT as surrogate	0.56	4.23	TNT as surrogate	--
HMX	2691-41-0	-- - --	0.87	SRC	5.26	RDX as surrogate	0.71	0.43	RDX as surrogate	--
Dioxin/Furans										
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	0.0075	K_{ow} Regression Eq.	NC	0.0065	K_{ow} Regression Eq.	Travis and Arms 1988

Table F.2-11
Soil Biocaccumulation/Bioconcentration Factors- Soil to Plant Pathway
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

CAS = Chemical Abstract Services

BAF = Bioaccumulation Factor

K_{ow} = Chemical octanol-water coefficient

NC = Not Calculated

C_s = Chemical Concentration in Soil

C_p = Chemical Concentration in Plant Matter (dry weight)

[1] = BAFs for chemical using Cp regression equation calculated by as follows: BAF = C_p/C_s

Source:

USEPA 1995: United States Environmental Protection Agency. 1995. Karickhoff, S.W. , and J.M. Long. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.

Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision

Bechtel Jacobs 1998: Bechtel Jacobs Company. September 1998. Emperical Models for the Uptake of Inorganic Chemical from Soil by Plants.

USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.

Travis and Arms 1988: Travis and Arms. 1988. Bioconcentration of Organics in Beef, Milk, and Vegetation. BAF values calculated for Tier I using lowest Kow value and for Tier II using the selected Kow value.

K_{ow} Regression Equation: BAF =10^((-0.578*K_{ow})+1.588))

Table F.2-12
Soil Biocaccumulation/Bioconcentration Factors - Soil to Invertebrate Pathway
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

							Preliminary Assessment		Refined Assessment			
Chemical	CAS	Log K_{ow} Range	Selected Log K_{ow}	Reference	K_{oc}	Reference	Value	Basis	C_s EPC (mg/kg)	BAF[1]	Basis	Source
Inorganics												
ARSENIC	7440-38-2	-- - --	--	--	--	--	0.52	90th percentile	1.49	0.2148	$C_e = e^{(0.706*\ln(Cs) - 1.421)}$	Sample et al. 1998
CADMIUM	7440-43-9	-- - --	--	--	--	--	40.7	90th percentile	0.44	9.7992	$C_e = e^{(0.795*\ln(Cs) + 2.114)}$	Sample et al. 1998
CHROMIUM	7440-47-3	-- - --	--	--	--	--	3.16	90th percentile	20.5	0.31	Median	Sample et al. 1998
COPPER	7440-50-8	-- - --	--	--	--	--	1.53	90th percentile	20.1	0.52	Median	Sample et al. 1998
LEAD	7439-92-1	-- - --	--	--	--	--	1.52	90th percentile	110.7	0.3242	$C_e = e^{(0.807*\ln(Cs) - 0.218)}$	Sample et al. 1998
MERCURY	7439-97-6	-- - --	--	--	--	--	20.6	90th percentile	0.122	1.69	Median	Sample et al. 1998
NICKEL	7440-02-0	-- - --	--	--	--	--	4.73	90th percentile	NC	1.06	Median	Sample et al. 1998
SELENIUM	7782-49-2	-- - --	--	--	--	--	1.34	90th percentile	1.134	0.8971	$C_e = e^{(0.733*\ln(Cs) - 0.075)}$	Sample et al. 1998
SILVER	7440-22-4	-- - --	--	--	--	--	15.3	90th percentile	NC	2.05	Median	Sample et al. 1998
ZINC	7440-66-6	-- - --	--	--	--	--	12.9	90th percentile	145.7	3.0084	$C_e = e^{(0.328*\ln(Cs) + 4.449)}$	Sample et al. 1998
Pesticides												
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	--	--	20.1	90th percentile	NC	NC	$C_e = e^{(0.88*\ln(Cs) + 2.4771)}$	USEPA 2005
4,4'-DDT	50-29-3	5.56 - 7.01	6.53	USEPA 1995	--	--	29.4	90th percentile	0.00751	14.0270	$C_e = e^{(0.8689*\ln(Cs) + 2.1287)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	5.89E+04	SRC, CF	4.00	Not Specified	NC	4.00	Not Specified	Edwards and Bohlen 1992
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	4.26E+03	SRC, CF	3.18	Jager Model	NC	3.18	Jager Model	USEPA 2005
ENDOSULFAN SULFATE	1031-07-8	-- - --	--	--	--	--	2.21	Endosulfan as Surrogate	NC	2.12	Endosulfan as Surrogate	--
ENDRIN ALDEHYDE	7421-93-4	-- - --	--	--	--	--	3.60	Endrin as Surrogate	NC	3.60	Endrin as Surrogate	--
GAMMA-BHC (LINDANE)	58-89-9	3.61 - 3.9	3.73	USEPA 1995	1.08E+03	SRC, CF	8.41	Jager Model	NC	5.98	Jager Model	USEPA 2005
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	5.89E+04	SRC, CF	4.00	Not Specified	NC	4.00	Not Specified	Edwards and Bohlen 1992
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	3.48E+03	SRC, CF	3.00	Not Specified	NC	3.00	Not Specified	Edwards and Bohlen 1992
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1.06E+01	SRC, CF	8.39	Not Specified	0.023	8.39	Not Specified	USEPA 1999
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	8.00E+04	SRC, CF	3.42	Jager Model	NC	1.21	Jager Model	USEPA 2005
PCBs												
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	--	--	15.9	90th percentile	0.0688	6.67	Median	Sample et al. 1998
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	--	--	15.9	90th percentile	0.02	6.67	Median	Sample et al. 1998
VOCs and SVOCs												
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	1.09E+04	USEPA 2005	2.72	Jager Model	0.51	0.87	Jager Model	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.07	USEPA 1995	9.47E+02	USEPA 2005	13.49	Jager Model	0.211	13.49	Jager Model	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	3.58E+05	USEPA 2005	1.12	Jager Model	NC	0.93	Jager Model	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	9.69E+05	USEPA 2005	1.24	Jager Model	0.0155	0.78	Jager Model	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	5.96E+05	USEPA 2005	2.28	Jager Model	0.0266	1.53	Jager Model	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1.43E+06	USEPA 2005	3.50	Jager Model	NC	1.73	Jager Model	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	5.96E+05	USEPA 2005	1.76	Jager Model	NC	1.53	Jager Model	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	2.48E+05	USEPA 2005	1.62	Jager Model	0.0475	1.35	Jager Model	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	1.79E+06	USEPA 2005	1.99	Jager Model	0.0211	1.36	Jager Model	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	4.95	USEPA 1995	4.17E+04	USEPA 2005	4.31	Jager Model	NC	1.79	Jager Model	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.58	USEPA 1995	1.17E+06	USEPA 2005	2.21	Jager Model	0.082	1.68	Jager Model	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	3.30E+04	USEPA 2005	1.05	Jager Model	0.0362	1.01	Jager Model	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	4.88	USEPA 1995	6.27E+04	USEPA 2005	3.72	Jager Model	0.0554	1.03	Jager Model	USEPA 2005
Explosives												
1,3,5-TNB	99-35-4	-- - --	--	--	--	--	1	Default Value	1.32	1	Default Value	--
2,4-DNT	121-14-2	-- - --	--	--	--	--	1	Default Value	1.65	1	Default Value	--
2,6-DNT	606-20-2	-- - --	--	--	--	--	1	Default Value	1.13	1	Default Value	--
2,4,6-TNT	118-96-7	-- - --	--	--	--	--	1	Default Value	13.6	1	Default Value	--
2-AMINO-4,6-DINITROTOLUENE	355-72-78-2	-- - --	--	--	--	--	1	Default Value	0.63	1	Default Value	--
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	-- - --	--	--	--	--	1	Default Value	0.56	1	Default Value	--
HMX	2691-41-0	-- - --	--	--	--	--	1	Default Value	0.71	1	Default Value	--
Dioxin/Furans												
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	--	--	22.2	90th percentile	NC	11	Median	Sample et al. 1998

Notes:

CAS = Chemical Abstract Services

C_s = Chemical Concentration in Soil

C_e = Chemical Concentration in Earthworm (dry weight)

K_{ow} = Chemical octanol-water coefficient

K_{oc} = Chemical water to soil partitioning coefficient

K_{ww} = Chemical worm to soil partitioning coefficient

foc = mean fraction organic content in soil

[1] = BAFs for chemical using Ce regression equation calculated by as follows: $BAF = C_e/C_s$

Table F.2-12
Soil Biocaccumulation/Bioconcentration Factors - Soil to Invertebrate Pathway
Screening Level Ecological Risk Assessment - Area A
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Radford Army Ammunition Plant, Radford, Virginia

References:

USEPA 1995: United States Environmental Protection Agency. Karickhoff, S.W. , and J.M. Long. 1995. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.

Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision

Sample et al. 1998: Sample, B.E., Beauchamp, J.J., Efroymson, R.A., Sutter, G.W., Ashwood, T.L., February 1998. Development and Validation of Bioaccumulation Models for Earthworms.

Jager Model: As presented in USEPA 2005, Guidance for Developing Ecological Screening Levels, Appendix 4-1, Table 5.

BAF = K_{ww}(L/kg worl dw)/K_d (L/kg soil dw)

K_{ww} (dry weight) = 10^(0.87*logK_{ow} - 2.0) / 0.16

Wet weight to dry weight assuming 16% solids

K_d = f_{oc} * K_{oc}

foc = 0.017 from site specific physical soil data

Note: The maximum Kow utilized for the Tier I calculation and the Selected Kow utilized for the Tier II calculation.

Edwards and Bohlen 1992: Edwards, C.A. and Bohlen, P.J. 1992. The effects of toxic chemicals on earthworms. Reviews of Environmental Contamination and Toxicology, 125: 23-99.

USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.

SRC/CF: Syracuse Research Corporation (SRC). Physical Properties Database. http://www.syrres.com/esc/physdemo.htm

Table F.2-13
Soil Bioaccumulation/Bioconcentration Factors - Soil to Mammal Pathway
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS	Log K_{ow} Range	Selected K_{ow}	Reference	Preliminary Assessment		Refined Assessment			Source
					Value	Basis	C_s (mg/kg)	BAF[1]	Basis	
Inorganics										
ARSENIC	7440-38-2	-- - --	--	--	0.0149	90th percentile	1.49	0.0073	$C_m = e^{(0.819*\ln(Cs) - 4.847)}$	Sample et al. 1998
CADMIUM	7440-43-9	-- - --	--	--	3.991	90th percentile	0.44	0.4387	$C_m = e^{(0.472*\ln(Cs) - 1.257)}$	Sample et al. 1998
CHROMIUM	7440-47-3	-- - --	--	--	0.333	90th percentile	20.5	0.1039	$C_m = e^{(0.734*\ln(Cs) - 1.46)}$	Sample et al. 1998
COPPER	7440-50-8	-- - --	--	--	1.045	90th percentile	20.1	0.5913	$C_m = e^{(0.144*\ln(Cs) + 2.042)}$	Sample et al. 1998
LEAD	7439-92-1	-- - --	--	--	0.286	90th percentile	110.7	0.0781	$C_m = e^{(0.442*\ln(Cs) + 0.0761)}$	Sample et al. 1998
MERCURY	7439-97-6	-- - --	--	--	0.192	90th percentile	0.122	0.0543	Median	Sample et al. 1998
NICKEL	7440-02-0	-- - --	--	--	0.589	90th percentile	NC	NC	$C_m = e^{(0.466*\ln(Cs) - 0.246)}$	Sample et al. 1998
SELENIUM	7782-49-2	-- - --	--	--	1.187	90th percentile	1.134	0.6100	$C_m = e^{(0.376*\ln(Cs) - 0.416)}$	Sample et al. 1998
SILVER	7440-22-4	-- - --	--	--	0.501	90th percentile	NC	0.004	Median	Sample et al. 1998
ZINC	7440-66-6	-- - --	--	--	2.69	90th percentile	145.7	0.7659	$C_m = e^{(0.071*\ln(Cs) + 4.363)}$	Sample et al. 1998
Pesticides										
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	1	Default Value	NC	NC	$C_m = e^{(0.641*\ln(Cd) + 3.640)}$	USEPA 2005
4,4'-DDT	50-29-3	5.56 - 7.01	6.53	USEPA 1995	1	Default Value	NC	NC	$C_m = e^{(0.725*\ln(Cd) + 1.179)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	1	Default Value	--
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	1	Default Value	NC	1	Default Value	--
ENDOSULFAN SULFATE	1031-07-8	-- - --	--	--	1	Default Value	NC	1	Default Value	--
ENDRIN ALDEHYDE	7421-93-4	-- - --	--	--	1	Default Value	NC	1	Default Value	--
GAMMA-BHC (LINDANE)	58-89-9	3.61 - 3.9	3.73	USEPA 1995	1	Default Value	NC	1	Default Value	--
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	1	Default Value	--
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	1	Default Value	NC	1	Default Value	--
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1	Default Value	0.023	1	Default Value	--
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	1	Default Value	NC	1	Default Value	--
PCBs										
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	1	Default Value	0.0688	1	Default Value	--
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	1	Default Value	0.02	1	Default Value	--
VOCs and SVOCs										
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	1	Default Value	0.51	0	--	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.07	USEPA 1995	1	Default Value	0.211	0	--	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	1	Default Value	0.0155	0	--	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	1	Default Value	0.0266	0	--	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	1	Default Value	0.0475	0	--	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	1	Default Value	0.0211	0	--	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	5.12	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.65	USEPA 1995	1	Default Value	0.082	0	--	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	1	Default Value	0.0362	0	--	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	5.11	USEPA 1995	1	Default Value	0.0554	0	--	USEPA 2005
Explosives										
1,3,5-TNB	99-35-4	-- - --	--	--	1	Default Value	1.32	0	TNT as surrogate	--
2,4-DNT	121-14-2	-- - --	--	--	1	Default Value	1.65	0	TNT as surrogate	--
2,6-DNT	606-20-2	-- - --	--	--	1	Default Value	1.13	0	TNT as surrogate	--
2,4,6-TNT	118-96-7	-- - --	--	--	1	Default Value	13.6	0	Cm = 0	USEPA 2005
2-AMINO-4,6-DINITROTOLUENE	355-72-78-2	-- - --	--	--	1	Default Value	0.63	0	TNT as surrogate	--
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	-- - --	--	--	1	Default Value	0.56	0	TNT as surrogate	--
HMX	2691-41-0	-- - --	--	--	1	Default Value	0.71	0	RDX as surrogate	--
Dioxin/Furans										
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	2.2	90th percentile	0.00000959	0.7199	$C_m = e^{(0.1089*\ln(Cs) + 0.7044)}$	Sample et al. 1998

Table F.2-13
Soil Bioaccumulation/Bioconcentration Factors - Soil to Mammal Pathway
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
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Notes:

CAS = Chemical Abstract Services

C_s = Chemical Concentration in Soil

C_d = Chemical Concentration in Prey (assumed to be 100% earthworms (dry weight))

C_m = Chemical Concentration in Mammal (dry weight)

K_{ow} = Chemical octanol to water partitioning coefficient

[1] = BAFs for chemical using Ce regression equation calculated by as follows: BAF = C_m/C_s

References:

USEPA 1995: United States Environmental Protection Agency. Karickhoff, S.W. , and J.M. Long. 1995. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.

Sample et al. 1998: Sample et al. 1998. Development and Validation of Bioaccumulation Models for Small Mammals.

Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision

USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.

Travis and Arms 1988: Travis and Arms. 1988. Bioconcentration of Organics in Beef, Milk, and Vegetation. BAF values calculated for Tier I using lowest Kow value and for Tier II using the selected Kow value.

K_{ow} Regression Equation: BAF =10^((-0.578*K_{ow})+1.588))

Table F.2-14
Preliminary Wildlife Risk Characterization - Meadow Vole
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics													
Arsenic	7440-38-2	1.20E-01	1.20E+00	2.5	1.1E+00	2.8E+00	1.8E-01	1.8E+00	**1.39E+01**	**1.4E+00**	**Y**	1.49	**8.3E+00**
Cadmium	7440-43-9	1.69E+00	1.69E+01	1.6	3.3E+00	5.2E+00	8.8E-01	8.8E+00	**1.8E+00**	1.8E-01	**Y**	0.44	5.0E-01
Chromium	7440-47-3	5.75E+00	5.75E+01	29.5	8.4E-02	2.5E+00	9.1E+01	9.1E+02	3.3E-01	3.3E-02	N	--	--
Copper	7440-50-8	2.67E+01	3.51E+01	84.1	6.3E-01	5.3E+01	7.0E+01	9.2E+01	**1.2E+00**	9.1E-01	**Y**	20.1	2.9E-01
Lead	7439-92-1	1.40E+01	1.40E+02	528	4.7E-01	2.5E+02	4.8E+01	4.8E+02	**1.1E+01**	**1.1E+00**	**Y**	111	**2.3E+00**
Mercury	7439-97-6	3.01E+01	3.01E+02	0.31	5.0E+00	1.6E+00	1.0E+01	1.0E+02	3.0E-02	3.0E-03	N	--	--
Nickel	7440-02-0	7.01E+01	1.40E+02	13.5	1.4E+00	1.9E+01	8.3E+01	1.7E+02	1.6E-01	8.1E-02	N	--	--
Selenium	7782-49-2	3.51E-01	5.79E-01	2	3.0E+00	6.0E+00	2.0E-01	3.2E-01	**1.0E+01**	**6.2E+00**	**Y**	1.13	**5.8E+00**
Silver	7440-22-4	3.89E+01	3.89E+02	0.089	3.7E-02	3.3E-03	1.1E+03	1.1E+04	8.2E-05	8.2E-06	N	--	--
Zinc	7440-66-6	2.81E+02	5.61E+02	337	1.8E+00	6.1E+02	2.6E+02	5.2E+02	**1.3E+00**	6.5E-01	**Y**	146	5.6E-01
Dioxin/Furans													
Total 2,3,7,8-TCDD Equivalents	1746-01-6	9.49E-07	9.49E-06	1.7E-05	7.5E-03	1.3E-07	5.1E-05	5.1E-04	3.3E-01	3.3E-02	N	--	--
TCL Pesticides/PCBs													
4,4'-DDE	72-55-9	4.03E+01	4.03E+02	0.0048	8.0E-02	3.8E-04	6.6E+02	6.6E+03	7.3E-06	7.3E-07	N	--	--
4,4'-DDT	50-29-3	1.40E+00	7.01E+00	0.026	6.2E-01	1.6E-02	3.7E+00	1.9E+01	7.0E-03	1.4E-03	N	--	--
alpha-Chlordane	5103-71-9	3.70E-01	3.70E+00	0.0031	1.0E+00	3.1E-03	6.1E-01	6.1E+00	5.0E-03	5.0E-04	N	--	--
delta-BHC	319-86-8	3.19E-02	3.19E-01	0.0005	1.0E+00	5.0E-04	5.3E-02	5.3E-01	9.4E-03	9.4E-04	N	--	--
Endosulfan Sulfate	1031-07-8	4.56E-02	4.56E-01	0.0018	1.0E+00	1.8E-03	7.6E-02	7.6E-01	2.4E-02	2.4E-03	N	--	--
Endrin Aldehyde	7421-93-4	8.73E-02	8.73E-01	0.0012	1.0E+00	1.2E-03	1.4E-01	1.4E+00	8.3E-03	8.3E-04	N	--	--
gamma-BHC (Lindane)	58-89-9	1.40E+01	1.40E+02	0.0016	1.0E+00	1.6E-03	2.3E+01	2.3E+02	6.9E-05	6.9E-06	N	--	--
gamma-Chlordane	5103-74-2	3.70E-01	3.70E+00	0.01	1.0E+00	1.0E-02	6.1E-01	6.1E+00	1.6E-02	1.6E-03	N	--	--
Heptachlor	76-44-8	2.28E-01	2.28E+00	0.0048	1.0E+00	4.8E-03	3.8E-01	3.8E+00	1.3E-02	1.3E-03	N	--	--
Heptachlor Epoxide	1024-57-3	4.38E-02	4.38E-01	0.11	1.0E+00	1.1E-01	7.3E-02	7.3E-01	**1.5E+00**	1.5E-01	**Y**	0.023	3.2E-01
Methoxychlor	72-43-5	7.01E+00	1.40E+01	0.0074	1.0E+00	7.4E-03	1.2E+01	2.3E+01	6.4E-04	3.2E-04	N	--	--
Aroclor1254	11097-69-1	6.45E-02	6.45E-01	0.2	6.8E-03	1.4E-03	3.6E+00	3.6E+01	5.6E-02	5.6E-03	N	--	--
Aroclor1260	11096-82-5	6.45E-02	6.45E-01	0.078	4.5E-03	3.5E-04	3.8E+00	3.8E+01	2.0E-02	2.0E-03	N	--	--
PAHs													
Acenaphthene	83-32-9	1.66E+01	8.30E+01	1.6	4.6E+00	7.4E+00	6.1E+00	3.1E+01	2.6E-01	5.2E-02	N	--	--
Acenaphthylene	208-96-8	1.75E+02	8.77E+02	1.1	4.6E+00	5.1E+00	6.4E+01	3.2E+02	1.7E-02	3.4E-03	N	--	--
Benzo(a)anthracene	56-55-3	2.91E-01	2.91E+00	0.049	5.4E-01	2.6E-02	8.8E-01	8.8E+00	5.6E-02	5.6E-03	N	--	--
Benzo(a)pyrene	50-32-8	9.49E-01	9.49E+00	0.058	3.3E+00	1.9E-01	4.9E-01	4.9E+00	1.2E-01	1.2E-02	N	--	--
Benzo(b)fluoranthene	205-99-2	9.49E-01	9.49E+00	0.11	4.8E-01	5.3E-02	3.2E+00	3.2E+01	3.4E-02	3.4E-03	N	--	--
Benzo(g,h,i)perylene	191-24-2	4.74E-01	2.37E+00	0.032	1.6E+00	5.1E-02	5.0E-01	2.5E+00	6.4E-02	1.3E-02	N	--	--
Benzo(k)fluoranthene	207-08-9	1.05E+01	1.05E+02	0.057	1.0E+00	5.7E-02	1.7E+01	1.7E+02	3.3E-03	3.3E-04	N	--	--
Chrysene	218-01-9	1.44E+01	1.44E+02	0.21	1.1E+00	2.2E-01	2.3E+01	2.3E+02	9.2E-03	9.2E-04	N	--	--
Dibenz(a,h)anthracene	53-70-3	1.94E+00	1.94E+01	0.036	2.3E-01	8.3E-03	1.3E+01	1.3E+02	2.8E-03	2.8E-04	N	--	--
Fluoranthene	206-44-0	2.91E+01	1.45E+02	0.09	6.0E+00	5.4E-01	8.2E+00	4.1E+01	1.1E-02	2.2E-03	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	1.05E+01	1.05E+02	0.39	1.5E-01	5.9E-02	1.0E+02	1.0E+03	3.8E-03	3.8E-04	N	--	--
Phenanthrene	85-01-8	6.64E+00	3.32E+01	0.12	1.1E+01	1.3E+00	1.0E+00	5.1E+00	1.2E-01	2.3E-02	N	--	--
Pyrene	129-00-0	7.59E+00	3.80E+01	0.18	3.7E+00	6.7E-01	3.5E+00	1.7E+01	5.2E-02	1.0E-02	N	--	--
Explosives													
1,3,5-Trinitrobenzene	99-35-4	4.61E+00	2.29E+01	7.6	8.5E+00	6.4E+01	9.2E-01	4.6E+00	**8.2E+00**	**1.7E+00**	**Y**	1.32	**1.4E+00**
2,4,6-Trinitrotoluene	118-96-7	8.82E+00	3.53E+01	130	8.5E+00	1.1E+03	1.8E+00	7.1E+00	**7.4E+01**	**1.8E+01**	**Y**	13.6	**7.7E+00**
2,4-Dinitrotoluene	121-14-2	NV	NV	17	8.5E+00	1.4E+02	--	--	--	--	--	--	--
2,6-Dinitrotoluene	606-20-2	NV	NV	11	8.5E+00	9.3E+01	--	--	--	--	--	--	--
2-Amino-4,6-Dinitrotoluene	355-72-78-2	1.55E+01	8.26E+01	5.7	8.5E+00	4.8E+01	3.1E+00	1.7E+01	**1.8E+00**	3.4E-01	**Y**	0.63	2.0E-01
4-Amino-2,6-Dinitrotoluene	1946-51-0	1.55E+01	8.26E+01	5.2	8.5E+00	4.4E+01	3.1E+00	1.7E+01	**1.7E+00**	3.1E-01	**Y**	0.56	1.8E-01
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	2691-41-0	8.88E+00	6.16E+01	6.8	5.3E+00	3.6E+01	2.9E+00	2.0E+01	**2.4E+00**	3.4E-01	**Y**	0.71	2.5E-01

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10
BW = Minimum Body Weigth of Receptor (kg)
IR_{food} = Maximum Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)
DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = 100% Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

Meadow Vole Specific Data from Table F.2-9

BW=	0.017	kg
IR_{food} =	0.010	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00024	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration
LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration
EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-15
Refined Wildlife Risk Characterization - Meadow Vole
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment						
				Soil						
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics										
Arsenic	7440-38-2	1.20E-01	1.20E+00	1.49	3.8E-02	5.6E-02	9.0E+00	9.0E+01	1.7E-01	1.7E-02
Cadmium	7440-43-9	1.69E+00	1.69E+01	0.44	9.0E-01	4.0E-01	8.4E+00	8.4E+01	5.2E-02	5.2E-03
Copper	7440-50-8	2.67E+01	3.51E+01	20.1	3.2E-01	6.4E+00	3.6E+02	4.8E+02	5.5E-02	4.2E-02
Lead	7439-92-1	1.40E+01	1.40E+02	110.7	3.4E-02	3.7E+00	1.1E+03	1.1E+04	9.8E-02	9.8E-03
Selenium	7782-49-2	3.51E-01	5.79E-01	1.134	5.1E-01	5.8E-01	3.0E+00	5.0E+00	3.8E-01	2.3E-01
Zinc	7440-66-6	2.81E+02	5.61E+02	145.7	5.2E-01	7.6E+01	2.4E+03	4.7E+03	6.1E-02	3.1E-02
TCL Pesticides/PCBs										
Heptachlor Epoxide	1024-57-3	4.38E-02	4.38E-01	0.023	5.0E-02	1.1E-03	2.8E+00	2.8E+01	8.4E-03	8.4E-04
Explosives										
1,3,5-Trinitrobenzene	99-35-4	4.61E+00	2.29E+01	1.32	4.2E+00	5.6E+00	5.0E+00	2.5E+01	2.6E-01	5.3E-02
2,4,6-Trinitrotoluene	118-96-7	8.82E+00	3.53E+01	13.6	4.2E+00	5.8E+01	9.6E+00	3.8E+01	**1.4E+00**	3.5E-01
2-Amino-4,6-Dinitrotoluene	355-72-78-2	1.55E+01	8.26E+01	0.63	4.2E+00	2.7E+00	1.7E+01	9.0E+01	3.7E-02	7.0E-03
4-Amino-2,6-Dinitrotoluene	1946-51-0	1.55E+01	8.26E+01	0.56	4.2E+00	2.4E+00	1.7E+01	9.0E+01	3.3E-02	6.2E-03
HMX (Octahydro-1,3,5,7-tetranitr	2691-41-0	8.88E+00	6.16E+01	0.71	4.3E-01	3.1E-01	9.0E+01	6.3E+02	7.8E-03	1.1E-03

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Meadow Vole Specific Data from Table F.2-9

BW=	0.037	kg
IR_{food} =	0.008	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	1.00	unitless
IR_{soil} =	0.00019	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-16
Preliminary Wildlife Risk Characterization - Short-tailed Shrew
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment												
				Soil												
				Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																
Arsenic	7440-38-2	1.50E-01	1.50E+00	2.5	1.1E+00	2.8E+00	5.2E-01	1.3E+00	Plant	5.1E-01	5.1E+00	**4.9E+00**	4.9E-01	**Y**	1.49	**2.9E+00**
Cadmium	7440-43-9	2.11E+00	2.11E+01	1.6	3.3E+00	5.2E+00	4.1E+01	6.5E+01	Invertebrate	2.2E-01	2.2E+00	**7.4E+00**	7.4E-01	**Y**	0.44	**2.0E+00**
Chromium	7440-47-3	7.21E+00	7.21E+01	29.5	8.4E-02	2.5E+00	3.2E+00	9.3E+01	Invertebrate	9.1E+00	9.1E+01	**3.2E+00**	3.2E-01	**Y**	20.5	**2.2E+00**
Copper	7440-50-8	3.34E+01	4.40E+01	84.1	6.3E-01	5.3E+01	1.5E+00	1.3E+02	Invertebrate	8.4E+01	1.1E+02	**1.0E+00**	7.6E-01	**Y**	20.1	2.4E-01
Lead	7439-92-1	1.76E+01	1.76E+02	528	4.7E-01	2.5E+02	1.5E+00	8.0E+02	Invertebrate	4.4E+01	4.4E+02	**1.2E+01**	**1.2E+00**	**Y**	110.7	**2.5E+00**
Mercury	7439-97-6	3.77E+01	3.77E+02	0.31	5.0E+00	1.6E+00	2.1E+01	6.4E+00	Invertebrate	7.6E+00	7.6E+01	4.1E-02	4.1E-03	N	--	--
Nickel	7440-02-0	8.79E+01	1.76E+02	13.5	1.4E+00	1.9E+01	4.7E+00	6.4E+01	Invertebrate	7.5E+01	1.5E+02	1.8E-01	9.0E-02	N	--	--
Selenium	7782-49-2	4.40E-01	7.25E-01	2	3.0E+00	6.0E+00	1.3E+00	2.7E+00	Plant	5.8E-01	9.6E-01	**3.4E+00**	**2.1E+00**	**Y**	1.134	**1.9E+00**
Silver	7440-22-4	4.88E+01	4.88E+02	0.089	3.7E-02	3.3E-03	1.5E+01	1.4E+00	Invertebrate	1.3E+01	1.3E+02	6.8E-03	6.8E-04	N	--	--
Zinc	7440-66-6	3.52E+02	7.03E+02	337	1.8E+00	6.1E+02	1.3E+01	4.3E+03	Invertebrate	1.1E+02	2.3E+02	**3.0E+00**	**1.5E+00**	**Y**	145.7	**1.3E+00**
Dioxin/Furans																
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.19E-06	1.19E-05	1.7E-05	7.5E-03	1.3E-07	2.2E+01	3.8E-04	Invertebrate	2.2E-07	2.2E-06	**7.7E+01**	**7.7E+00**	**Y**	9.59E-06	**4.3E+01**
TCL Pesticides/PCBs																
4,4'-DDE	72-55-9	5.06E+01	5.06E+02	0.0048	8.0E-02	3.8E-04	2.0E+01	9.6E-02	Invertebrate	1.0E+01	1.0E+02	4.6E-04	4.6E-05	N	--	--
4,4'-DDT	50-29-3	1.76E+00	8.79E+00	0.026	6.2E-01	1.6E-02	2.9E+01	7.6E-01	Invertebrate	2.5E-01	1.2E+00	1.0E-01	2.1E-02	N	--	--
alpha-Chlordane	5103-71-9	4.64E-01	4.64E+00	0.0031	1.0E+00	3.1E-03	4.0E+00	1.2E-02	Invertebrate	4.7E-01	4.7E+00	6.6E-03	6.6E-04	N	--	--
delta-BHC	319-86-8	4.00E-02	4.00E-01	0.0005	1.0E+00	5.0E-04	3.2E+00	1.6E-03	Invertebrate	5.0E-02	5.0E-01	9.9E-03	9.9E-04	N	--	--
Endosulfan Sulfate	1031-07-8	5.71E-02	5.71E-01	0.0018	1.0E+00	1.8E-03	2.2E+00	4.0E-03	Invertebrate	1.0E-01	1.0E+00	1.8E-02	1.8E-03	N	--	--
Endrin Aldehyde	7421-93-4	1.09E-01	1.09E+00	0.0012	1.0E+00	1.2E-03	3.6E+00	4.3E-03	Invertebrate	1.2E-01	1.2E+00	9.8E-03	9.8E-04	N	--	--
gamma-BHC (Lindane)	58-89-9	1.76E+01	1.76E+02	0.0016	1.0E+00	1.6E-03	8.4E+00	1.3E-02	Invertebrate	8.6E+00	8.6E+01	1.9E-04	1.9E-05	N	--	--
gamma-Chlordane	5103-74-2	4.64E-01	4.64E+00	0.01	1.0E+00	1.0E-02	4.0E+00	4.0E-02	Invertebrate	4.7E-01	4.7E+00	2.1E-02	2.1E-03	N	--	--
Heptachlor	76-44-8	2.86E-01	2.86E+00	0.0048	1.0E+00	4.8E-03	3.0E+00	1.4E-02	Invertebrate	3.8E-01	3.8E+00	1.3E-02	1.3E-03	N	--	--
Heptachlor Epoxide	1024-57-3	5.49E-02	5.49E-01	0.11	1.0E+00	1.1E-01	8.4E+00	9.2E-01	Invertebrate	2.7E-02	2.7E-01	**4.1E+00**	4.1E-01	**Y**	0.023	8.6E-01
Methoxychlor	72-43-5	8.79E+00	1.76E+01	0.0074	1.0E+00	7.4E-03	3.4E+00	2.5E-02	Invertebrate	1.0E+01	2.1E+01	7.2E-04	3.6E-04	N	--	--
Aroclor1254	11097-69-1	8.09E-02	8.09E-01	0.2	6.8E-03	1.4E-03	1.6E+01	3.2E+00	Invertebrate	2.1E-02	2.1E-01	**9.5E+00**	9.5E-01	**Y**	0.0688	**3.3E+00**
Aroclor1260	11096-82-5	8.09E-02	8.09E-01	0.078	4.5E-03	3.5E-04	1.6E+01	1.2E+00	Invertebrate	2.1E-02	2.1E-01	**3.7E+00**	3.7E-01	**Y**	0.02	9.5E-01
PAHs																
Acenaphthene	83-32-9	2.08E+01	1.04E+02	1.6	4.6E+00	7.4E+00	2.7E+00	4.3E+00	Plant	1.8E+01	9.2E+01	8.7E-02	1.7E-02	N	--	--
Acenaphthylene	208-96-8	2.20E+02	1.10E+03	1.1	4.6E+00	5.1E+00	1.3E+01	1.5E+01	Invertebrate	6.7E+01	3.4E+02	1.6E-02	3.3E-03	N	--	--
Benzo(a)anthracene	56-55-3	3.64E-01	3.64E+00	0.049	5.4E-01	2.6E-02	1.1E+00	5.5E-02	Invertebrate	1.2E+00	1.2E+01	4.0E-02	4.0E-03	N	--	--
Benzo(a)pyrene	50-32-8	1.19E+00	1.19E+01	0.058	3.3E+00	1.9E-01	1.2E+00	7.2E-02	Plant	1.4E+00	1.4E+01	4.0E-02	4.0E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	1.19E+00	1.19E+01	0.11	4.8E-01	5.3E-02	2.3E+00	2.5E-01	Invertebrate	2.1E+00	2.1E+01	5.4E-02	5.4E-03	N	--	--
Benzo(g,h,i)perylene	191-24-2	5.95E-01	2.97E+00	0.032	1.6E+00	5.1E-02	3.5E+00	1.1E-01	Invertebrate	6.8E-01	3.4E+00	4.7E-02	9.4E-03	N	--	--
Benzo(k)fluoranthene	207-08-9	1.31E+01	1.31E+02	0.057	1.0E+00	5.7E-02	1.8E+00	1.0E-01	Invertebrate	2.9E+01	2.9E+02	2.0E-03	2.0E-04	N	--	--
Chrysene	218-01-9	1.80E+01	1.80E+02	0.21	1.1E+00	2.2E-01	1.6E+00	3.4E-01	Invertebrate	4.3E+01	4.3E+02	4.9E-03	4.9E-04	N	--	--
Dibenz(a,h)anthracene	53-70-3	2.43E+00	2.43E+01	0.036	2.3E-01	8.3E-03	2.0E+00	7.2E-02	Invertebrate	4.8E+00	4.8E+01	7.5E-03	7.5E-04	N	--	--
Fluoranthene	206-44-0	3.64E+01	1.82E+02	0.09	6.0E+00	5.4E-01	4.3E+00	3.9E-01	Plant	2.5E+01	1.2E+02	3.6E-03	7.3E-04	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	1.31E+01	1.31E+02	0.39	1.5E-01	5.9E-02	2.2E+00	8.6E-01	Invertebrate	2.3E+01	2.3E+02	1.7E-02	1.7E-03	N	--	--
Phenanthrene	85-01-8	8.32E+00	4.16E+01	0.12	1.1E+01	1.3E+00	1.1E+00	1.3E-01	Plant	3.1E+00	1.6E+01	3.9E-02	7.7E-03	N	--	--
Pyrene	129-00-0	9.51E+00	4.76E+01	0.18	3.7E+00	6.7E-01	3.7E+00	6.7E-01	Invertebrate	1.0E+01	5.1E+01	1.7E-02	3.5E-03	N	--	--
Explosives																
1,3,5-Trinitrobenzene	99-35-4	5.78E+00	2.87E+01	7.6	8.5E+00	6.4E+01	1.0E+00	7.6E+00	Plant	2.8E+00	1.4E+01	**2.7E+00**	5.5E-01	**Y**	1.32	4.7E-01
2,4,6-Trinitrotoluene	118-96-7	1.11E+01	4.42E+01	130	8.5E+00	1.1E+03	1.0E+00	1.3E+02	Plant	5.4E+00	2.1E+01	**2.4E+01**	**6.1E+00**	**Y**	13.6	**2.5E+00**
2,4-Dinitrotoluene	121-14-2	NV	NV	17	8.5E+00	1.4E+02	1.0E+00	1.7E+01	Plant	--	--	--	--	--	--	--
2,6-Dinitrotoluene	606-20-2	NV	NV	11	8.5E+00	9.3E+01	1.0E+00	1.1E+01	Plant	--	--	--	--	--	--	--
2-Amino-4,6-Dinitrotoluene	355-72-78-2	1.94E+01	1.04E+02	5.7	8.5E+00	4.8E+01	1.0E+00	5.7E+00	Plant	9.4E+00	5.0E+01	6.1E-01	1.1E-01	N	--	--
4-Amino-2,6-Dinitrotoluene	1946-51-0	1.94E+01	1.04E+02	5.2	8.5E+00	4.4E+01	1.0E+00	5.2E+00	Plant	9.4E+00	5.0E+01	5.5E-01	1.0E-01	N	--	--
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	2691-41-0	1.11E+01	7.72E+01	6.8	5.3E+00	3.6E+01	1.0E+00	6.8E+00	Plant	8.6E+00	6.0E+01	7.9E-01	1.1E-01	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Short-tailed Shrew Specific Data from Table F.2-9

BW=	0.0125	kg
IR_{food} =	0.003	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00039	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Screening Level

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Screening Level

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-17
Refined Wildlife Risk Characterization - Short-tailed Shrew
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment								
				Soil								
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics												
Arsenic	7440-38-2	1.50E-01	1.50E+00	1.49	3.8E-02	5.6E-02	2.15E-01	3.2E-01	3.5E+00	3.5E+01	4.2E-01	4.2E-02
Cadmium	7440-43-9	2.11E+00	2.11E+01	0.44	9.0E-01	4.0E-01	9.8E+00	4.3E+00	1.8E+00	1.8E+01	2.4E-01	2.4E-02
Chromium	7440-47-3	7.21E+00	7.21E+01	20.5	4.1E-02	8.4E-01	3.1E-01	6.3E+00	1.4E+02	1.4E+03	1.5E-01	1.5E-02
Lead	7439-92-1	1.76E+01	1.76E+02	110.7	3.4E-02	3.7E+00	3.2E-01	3.6E+01	3.2E+02	3.2E+03	3.5E-01	3.5E-02
Selenium	7782-49-2	4.40E-01	7.25E-01	1.134	5.1E-01	5.8E-01	9.0E-01	1.0E+00	3.4E+00	5.6E+00	3.3E-01	2.0E-01
Zinc	7440-66-6	3.52E+02	7.03E+02	145.7	5.2E-01	7.6E+01	3.0E+00	4.4E+02	9.5E+02	1.9E+03	1.5E-01	7.7E-02
Dioxin/Furans												
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.19E-06	1.19E-05	9.59E-06	6.5E-03	6.2E-08	1.1E+01	1.1E-04	9.3E-07	9.3E-06	**1.0E+01**	1.0E+00
TCL Pesticides/PCBs												
Heptachlor Epoxide	1024-57-3	5.49E-02	5.49E-01	0.023	5.0E-02	1.1E-03	8.4E+00	1.9E-01	5.6E-02	5.6E-01	4.1E-01	4.1E-02
Aroclor1254	11097-69-1	8.09E-02	8.09E-01	0.0688	6.8E-03	4.7E-04	6.7E+00	4.6E-01	1.0E-01	1.0E+00	6.7E-01	6.7E-02
Aroclor1260	11096-82-5	8.09E-02	8.09E-01	0.02	4.5E-03	9.1E-05	6.7E+00	1.3E-01	1.0E-01	1.0E+00	1.9E-01	1.9E-02
Explosives												
1,3,5-Trinitrobenzene	99-35-4	5.78E+00	2.87E+01	1.32	4.2E+00	5.6E+00	1.0E+00	1.3E+00	2.7E+01	1.4E+02	4.8E-02	9.7E-03
2,4,6-Trinitrotoluene	118-96-7	1.11E+01	4.42E+01	13.6	4.2E+00	5.8E+01	1.0E+00	1.4E+01	5.2E+01	2.1E+02	2.6E-01	6.5E-02

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10
BW = Average Body Weigth of Receptor (kg)
IR_{food} = Average Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor, specific to prey type and chemical
DF = Dietary fraction
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

Short-tailed Shrew Specific Data from Table F.2-9

BW=	0.015	kg
IR_{food} =	0.002	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.14	unitless
DF_{inv} =	0.86	unitless
IR_{soil} =	0.00026	kg dw/day
AF =	1.000	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level
LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-18
Preliminary Wildlife Risk Characterization - Red Fox
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																		
Arsenic	7440-38-2	3.59E-02	3.59E-01	2.5	1.1E+00	2.8E+00	5.2E-01	1.3E+00	1.5E-02	3.7E-02	Plant	2.7E-01	2.7E+00	**9.1E+00**	9.1E-01	**Y**	1.49	**5.4E+00**
Cadmium	7440-43-9	5.07E-01	5.07E+00	1.6	3.3E+00	5.2E+00	4.1E+01	6.5E+01	4.0E+00	6.4E+00	Invertebrate	1.1E-01	1.1E+00	**1.5E+01**	**1.5E+00**	**Y**	0.44	**4.1E+00**
Chromium	7440-47-3	1.73E+00	1.73E+01	29.5	8.4E-02	2.5E+00	3.2E+00	9.3E+01	3.3E-01	9.8E+00	Invertebrate	4.7E+00	4.7E+01	**6.3E+00**	6.3E-01	**Y**	20.5	**4.4E+00**
Copper	7440-50-8	8.02E+00	1.06E+01	84.1	6.3E-01	5.3E+01	1.5E+00	1.3E+02	1.0E+00	8.8E+01	Invertebrate	4.4E+01	5.8E+01	**1.9E+00**	**1.4E+00**	**Y**	20.1	4.5E-01
Lead	7439-92-1	4.22E+00	4.22E+01	528	4.7E-01	2.5E+02	1.5E+00	8.0E+02	2.9E-01	1.5E+02	Invertebrate	2.3E+01	2.3E+02	**2.2E+01**	**2.2E+00**	**Y**	110.7	**4.7E+00**
Mercury	7439-97-6	9.05E+00	9.05E+01	0.31	5.0E+00	1.6E+00	2.1E+01	6.4E+00	1.9E-01	6.0E-02	Invertebrate	3.8E+00	3.8E+01	8.2E-02	8.2E-03	N	--	--
Nickel	7440-02-0	2.11E+01	4.22E+01	13.5	1.4E+00	1.9E+01	4.7E+00	6.4E+01	5.9E-01	8.0E+00	Invertebrate	3.8E+01	7.6E+01	3.5E-01	1.8E-01	N	--	--
Selenium	7782-49-2	1.05E-01	1.74E-01	2	3.0E+00	6.0E+00	1.3E+00	2.7E+00	1.2E+00	2.4E+00	Plant	3.0E-01	4.9E-01	**6.7E+00**	**4.1E+00**	**Y**	1.134	**3.8E+00**
Silver	7440-22-4	1.17E+01	1.17E+02	0.089	3.7E-02	3.3E-03	1.5E+01	1.4E+00	5.0E-01	4.5E-02	Invertebrate	6.6E+00	6.6E+01	1.4E-02	1.4E-03	N	--	--
Zinc	7440-66-6	8.44E+01	1.69E+02	337	1.8E+00	6.1E+02	1.3E+01	4.3E+03	2.7E+00	9.1E+02	Invertebrate	5.6E+01	1.1E+02	**6.0E+00**	**3.0E+00**	**Y**	145.7	**2.6E+00**
Dioxin/Furans																		
Total 2,3,7,8-TCDD Equivalents	1746-01-6	2.85E-07	2.85E-06	1.7E-04	7.5E-03	1.3E-06	2.2E+01	3.8E-03	2.2E+00	3.7E-04	Invertebrate	1.1E-07	1.1E-06	**1.5E+03**	**1.5E+02**	**Y**	9.59E-06	**8.7E+01**
TCL Pesticides/PCBs																		
4,4'-DDE	72-55-9	1.21E+01	1.21E+02	0.0048	8.0E-02	3.8E-04	2.0E+01	9.6E-02	1.0E+00	4.8E-03	Invertebrate	5.2E+00	5.2E+01	9.2E-04	9.2E-05	N	--	--
4,4'-DDT	50-29-3	4.22E-01	2.11E+00	0.026	6.2E-01	1.6E-02	2.9E+01	7.6E-01	1.0E+00	2.6E-02	Invertebrate	1.2E-01	6.2E-01	2.1E-01	4.2E-02	N	--	--
alpha-Chlordane	5103-71-9	1.11E-01	1.11E+00	0.0031	1.0E+00	3.1E-03	4.0E+00	1.2E-02	1.0E+00	3.1E-03	Invertebrate	2.4E-01	2.4E+00	1.3E-02	1.3E-03	N	--	--
delta-BHC	319-86-8	9.60E-03	9.60E-02	0.0005	1.0E+00	5.0E-04	3.2E+00	1.6E-03	1.0E+00	5.0E-04	Invertebrate	2.6E-02	2.6E-01	1.9E-02	1.9E-03	N	--	--
Endosulfan Sulfate	1031-07-8	1.37E-02	1.37E-01	0.0018	1.0E+00	1.8E-03	2.2E+00	4.0E-03	1.0E+00	1.8E-03	Invertebrate	5.3E-02	5.3E-01	3.4E-02	3.4E-03	N	--	--
Endrin Aldehyde	7421-93-4	2.62E-02	2.62E-01	0.0012	1.0E+00	1.2E-03	3.6E+00	4.3E-03	1.0E+00	1.2E-03	Invertebrate	6.2E-02	6.2E-01	1.9E-02	1.9E-03	N	--	--
gamma-BHC (Lindane)	58-89-9	4.22E+00	4.22E+01	0.0016	1.0E+00	1.6E-03	8.4E+00	1.3E-02	1.0E+00	1.6E-03	Invertebrate	4.3E+00	4.3E+01	3.7E-04	3.7E-05	N	--	--
gamma-Chlordane	5103-74-2	1.11E-01	1.11E+00	0.01	1.0E+00	1.0E-02	4.0E+00	4.0E-02	1.0E+00	1.0E-02	Invertebrate	2.4E-01	2.4E+00	4.2E-02	4.2E-03	N	--	--
Heptachlor	76-44-8	6.85E-02	6.85E-01	0.0048	1.0E+00	4.8E-03	3.0E+00	1.4E-02	1.0E+00	4.8E-03	Invertebrate	2.0E-01	2.0E+00	2.5E-02	2.5E-03	N	--	--
Heptachlor Epoxide	1024-57-3	1.32E-02	1.32E-01	0.11	1.0E+00	1.1E-01	8.4E+00	9.2E-01	1.0E+00	1.1E-01	Invertebrate	1.4E-02	1.4E-01	**8.1E+00**	8.1E-01	**Y**	0.023	**1.7E+00**
Methoxychlor	72-43-5	2.11E+00	4.22E+00	0.0074	1.0E+00	7.4E-03	3.4E+00	2.5E-02	1.0E+00	7.4E-03	Invertebrate	5.3E+00	1.1E+01	1.4E-03	7.0E-04	N	--	--
Aroclor1254	11097-69-1	1.94E-02	1.94E-01	0.2	6.8E-03	1.4E-03	1.6E+01	3.2E+00	1.0E+00	2.0E-01	Invertebrate	1.1E-02	1.1E-01	**1.9E+01**	**1.9E+00**	**Y**	0.0688	**6.5E+00**
Aroclor1260	11096-82-5	1.94E-02	1.94E-01	0.078	4.5E-03	3.5E-04	1.6E+01	1.2E+00	1.0E+00	7.8E-02	Invertebrate	1.1E-02	1.1E-01	**7.4E+00**	7.4E-01	**Y**	0.02	**1.9E+00**
PAHs																		
Acenaphthene	83-32-9	4.99E+00	2.50E+01	1.6	4.6E+00	7.4E+00	2.7E+00	4.3E+00	1.0E+00	1.6E+00	Plant	9.3E+00	4.7E+01	1.7E-01	3.4E-02	N	--	--
Acenaphthylene	208-96-8	5.27E+01	2.64E+02	1.1	4.6E+00	5.1E+00	1.3E+01	1.5E+01	1.0E+00	1.1E+00	Invertebrate	3.4E+01	1.7E+02	3.3E-02	6.5E-03	N	--	--
Benzo(a)anthracene	56-55-3	8.74E-02	8.74E-01	0.049	5.4E-01	2.6E-02	1.1E+00	5.5E-02	1.0E+00	4.9E-02	Invertebrate	6.6E-01	6.6E+00	7.5E-02	7.5E-03	N	--	--
Benzo(a)pyrene	50-32-8	2.85E-01	2.85E+00	0.058	3.3E+00	1.9E-01	1.2E+00	7.2E-02	1.0E+00	5.8E-02	Plant	7.4E-01	7.4E+00	7.8E-02	7.8E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	2.85E-01	2.85E+00	0.11	4.8E-01	5.3E-02	2.3E+00	2.5E-01	1.0E+00	1.1E-01	Invertebrate	1.1E+00	1.1E+01	1.0E-01	1.0E-02	N	--	--
Benzo(g,h,i)perylene	191-24-2	1.43E-01	7.13E-01	0.032	1.6E+00	5.1E-02	3.5E+00	1.1E-01	1.0E+00	3.2E-02	Invertebrate	3.5E-01	1.7E+00	9.2E-02	1.8E-02	N	--	--
Benzo(k)fluoranthene	207-08-9	3.15E+00	3.15E+01	0.057	1.0E+00	5.7E-02	1.8E+00	1.0E-01	1.0E+00	5.7E-02	Invertebrate	1.5E+01	1.5E+02	3.8E-03	3.8E-04	N	--	--
Chrysene	218-01-9	4.32E+00	4.32E+01	0.21	1.1E+00	2.2E-01	1.6E+00	3.4E-01	1.0E+00	2.1E-01	Invertebrate	2.3E+01	2.3E+02	9.3E-03	9.3E-04	N	--	--
Dibenz(a,h)anthracene	53-70-3	5.82E-01	5.82E+00	0.036	2.3E-01	8.3E-03	2.0E+00	7.2E-02	1.0E+00	3.6E-02	Invertebrate	2.5E+00	2.5E+01	1.4E-02	1.4E-03	N	--	--
Fluoranthene	206-44-0	8.74E+00	4.37E+01	0.09	6.0E+00	5.4E-01	4.3E+00	3.9E-01	1.0E+00	9.0E-02	Plant	1.3E+01	6.3E+01	7.2E-03	1.4E-03	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	3.15E+00	3.15E+01	0.39	1.5E-01	5.9E-02	2.2E+00	8.6E-01	1.0E+00	3.9E-01	Invertebrate	1.2E+01	1.2E+02	3.2E-02	3.2E-03	N	--	--
Phenanthrene	85-01-8	2.00E+00	9.98E+00	0.12	1.1E+01	1.3E+00	1.1E+00	1.3E-01	1.0E+00	1.2E-01	Plant	1.6E+00	7.8E+00	7.7E-02	1.5E-02	N	--	--
Pyrene	129-00-0	2.28E+00	1.14E+01	0.18	3.7E+00	6.7E-01	3.7E+00	6.7E-01	1.0E+00	1.8E-01	Invertebrate	5.3E+00	2.6E+01	3.4E-02	6.9E-03	N	--	--
Explosives																		
1,3,5-Trinitrobenzene	99-35-4	1.39E+00	6.89E+00	7.6	8.5E+00	6.4E+01	1.0E+00	7.6E+00	1.0E+00	7.6E+00	Plant	1.4E+00	7.0E+00	**5.4E+00**	**1.1E+00**	**Y**	1.32	9.4E-01
2,4,6-Trinitrotoluene	118-96-7	2.65E+00	1.06E+01	130	8.5E+00	1.1E+03	1.0E+00	1.3E+02	1.0E+00	1.3E+02	Plant	2.7E+00	1.1E+01	**4.8E+01**	**1.2E+01**	**Y**	13.6	**5.0E+00**
2,4-Dinitrotoluene	121-14-2	NV	NV	17	8.5E+00	1.4E+02	1.0E+00	1.7E+01	1.0E+00	1.7E+01	Plant	--	--	--	--	--	--	--
2,6-Dinitrotoluene	606-20-2	NV	NV	11	8.5E+00	9.3E+01	1.0E+00	1.1E+01	1.0E+00	1.1E+01	Plant	--	--	--	--	--	--	--
2-Amino-4,6-Dinitrotoluene	355-72-78-2	4.66E+00	2.48E+01	5.7	8.5E+00	4.8E+01	1.0E+00	5.7E+00	1.0E+00	5.7E+00	Plant	4.7E+00	2.5E+01	**1.2E+00**	2.3E-01	**Y**	0.63	1.3E-01
4-Amino-2,6-Dinitrotoluene	1946-51-0	4.66E+00	2.48E+01	5.2	8.5E+00	4.4E+01	1.0E+00	5.2E+00	1.0E+00	5.2E+00	Plant	4.7E+00	2.5E+01	**1.1E+00**	2.1E-01	**Y**	0.56	1.2E-01
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	2691-41-0	2.67E+00	1.85E+01	6.8	5.3E+00	3.6E+01	1.0E+00	6.8E+00	1.0E+00	6.8E+00	Plant	4.4E+00	3.0E+01	**1.6E+00**	2.2E-01	**Y**	0.71	1.6E-01

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Red FoxSpecific Data from Table F.2-9

BW=	2.9500	kg
IR_{food} =	0.342	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00960	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Screening Level

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Screening Level

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-19
Refined Wildlife Risk Characterization - Red Fox
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment										
				Soil										
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics														
Arsenic	7440-38-2	3.59E-02	3.59E-01	1.49	3.8E-02	5.6E-02	2.1E-01	3.2E-01	7.3E-03	1.1E-02	2.0E+03	2.0E+04	7.5E-04	7.5E-05
Cadmium	7440-43-9	5.07E-01	5.07E+00	0.44	9.0E-01	4.0E-01	9.8E+00	4.3E+00	4.4E-01	1.9E-01	1.5E+03	1.5E+04	2.9E-04	2.9E-05
Chromium	7440-47-3	1.73E+00	1.73E+01	20.5	4.1E-02	8.4E-01	3.1E-01	6.3E+00	1.0E-01	2.1E+00	3.6E+04	3.6E+05	5.6E-04	5.6E-05
Copper	7440-50-8	8.02E+00	1.06E+01	20.1	3.2E-01	6.4E+00	5.2E-01	1.0E+01	5.9E-01	1.2E+01	3.8E+04	5.0E+04	5.3E-04	4.0E-04
Lead	7439-92-1	4.22E+00	4.22E+01	110.7	3.4E-02	3.7E+00	3.2E-01	3.6E+01	7.8E-02	8.6E+00	1.1E+05	1.1E+06	1.0E-03	1.0E-04
Selenium	7782-49-2	1.05E-01	1.74E-01	1.134	5.1E-01	5.8E-01	9.0E-01	1.0E+00	6.1E-01	6.9E-01	4.5E+02	7.5E+02	2.5E-03	1.5E-03
Zinc	7440-66-6	8.44E+01	1.69E+02	145.7	5.2E-01	7.6E+01	3.0E+00	4.4E+02	7.7E-01	1.1E+02	2.7E+05	5.4E+05	5.4E-04	2.7E-04
Dioxin/Furans														
Total 2,3,7,8-TCDD Equivalents	1746-01-6	2.85E-07	2.85E-06	9.59E-06	6.5E-03	6.2E-08	1.1E+01	1.1E-04	7.2E-01	6.9E-06	7.5E-04	7.5E-03	1.3E-02	1.3E-03
TCL Pesticides/PCBs														
Heptachlor Epoxide	1024-57-3	1.32E-02	1.32E-01	0.023	5.0E-02	1.1E-03	8.4E+00	1.9E-01	1.0E+00	2.3E-02	3.1E+01	3.1E+02	7.5E-04	7.5E-05
Aroclor1254	11097-69-1	1.94E-02	1.94E-01	0.0688	6.8E-03	4.7E-04	6.7E+00	4.6E-01	1.0E+00	6.9E-02	4.9E+01	4.9E+02	1.4E-03	1.4E-04
Aroclor1260	11096-82-5	1.94E-02	1.94E-01	0.02	4.5E-03	9.1E-05	6.7E+00	1.3E-01	1.0E+00	2.0E-02	4.9E+01	4.9E+02	4.1E-04	4.1E-05
Explosives														
1,3,5-Trinitrobenzene	99-35-4	1.39E+00	6.89E+00	1.32	4.2E+00	5.6E+00	1.0E+00	1.3E+00	0.0E+00	0.0E+00	4.8E+03	2.4E+04	2.8E-04	5.5E-05
2,4,6-Trinitrotoluene	118-96-7	2.65E+00	1.06E+01	13.6	4.2E+00	5.8E+01	1.0E+00	1.4E+01	0.0E+00	0.0E+00	9.2E+03	3.7E+04	1.5E-03	3.7E-04
2-Amino-4,6-Dinitrotoluene	355-72-78-2	4.66E+00	2.48E+01	0.63	4.2E+00	2.7E+00	1.0E+00	6.3E-01	0.0E+00	0.0E+00	1.6E+04	8.6E+04	3.9E-05	7.3E-06
4-Amino-2,6-Dinitrotoluene	1946-51-0	4.66E+00	2.48E+01	0.56	4.2E+00	2.4E+00	1.0E+00	5.6E-01	0.0E+00	0.0E+00	1.6E+04	8.6E+04	3.5E-05	6.5E-06
HMX (Octahydro-1,3,5,7-tetranitro-	2691-41-0	2.67E+00	1.85E+01	0.71	4.3E-01	3.1E-01	1.0E+00	7.1E-01	0.0E+00	0.0E+00	5.1E+04	3.6E+05	1.4E-05	2.0E-06

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10
BW = Average Body Weigth of Receptor (kg)
IR_{food} = Average Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor, specific to prey type and chemical
DF = Dietary fraction
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

Red FoxSpecific Data from Table F.2-9

BW=	4.5300	kg
IR_{food} =	0.238	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.17	unitless
DF_{inv} =	0.04	unitless
DF_{mam} =	0.79	unitless
IR_{soil} =	0.00670	kg dw/day
AF =	0.0070	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level
LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-20
Preliminary Wildlife Risk Characterization - American Robin
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																
Arsenic	7440-38-2	5.14E+00	1.28E+01	2.5	1.1E+00	2.8E+00	5.2E-01	1.3E+00	Plant	1.4E+01	3.5E+01	1.8E-01	7.1E-02	N	--	--
Cadmium	7440-43-9	1.45E+00	2.00E+01	1.6	3.3E+00	5.2E+00	4.1E+01	6.5E+01	Invertebrate	1.1E-01	1.6E+00	**1.4E+01**	**1.0E+00**	**Y**	0.44	**3.9E+00**
Chromium	7440-47-3	1.00E+00	5.00E+00	29.5	8.4E-02	2.5E+00	3.2E+00	9.3E+01	Invertebrate	9.9E-01	4.9E+00	**3.0E+01**	**6.0E+00**	**Y**	20.5	**2.1E+01**
Copper	7440-50-8	4.70E+01	6.17E+01	84.1	6.3E-01	5.3E+01	1.5E+00	1.3E+02	Invertebrate	9.4E+01	1.2E+02	8.9E-01	6.8E-01	N	--	--
Lead	7439-92-1	1.13E+00	1.13E+01	528	4.7E-01	2.5E+02	1.5E+00	8.0E+02	Invertebrate	2.3E+00	2.3E+01	**2.3E+02**	**2.3E+01**	**Y**	110.7	**4.9E+01**
Mercury	7439-97-6	4.50E-01	9.00E-01	0.31	5.0E+00	1.6E+00	2.1E+01	6.4E+00	Invertebrate	6.9E-02	1.4E-01	**4.5E+00**	**2.2E+00**	**Y**	0.122	**1.8E+00**
Nickel	7440-02-0	7.74E+01	1.07E+02	13.5	1.4E+00	1.9E+01	4.7E+00	6.4E+01	Invertebrate	5.1E+01	7.1E+01	2.6E-01	1.9E-01	N	--	--
Selenium	7782-49-2	4.00E-01	8.00E-01	2	3.0E+00	6.0E+00	1.3E+00	2.7E+00	Plant	4.1E-01	8.3E-01	**4.8E+00**	**2.4E+00**	**Y**	1.134	**2.7E+00**
Silver	7440-22-4	1.66E+01	1.24E+02	0.089	3.7E-02	3.3E-03	1.5E+01	1.4E+00	Invertebrate	3.4E+00	2.6E+01	2.6E-02	3.5E-03	N	--	--
Zinc	7440-66-6	1.45E+01	1.31E+02	337	1.8E+00	6.1E+02	1.3E+01	4.3E+03	Invertebrate	3.6E+00	3.2E+01	**9.5E+01**	**1.0E+01**	**Y**	145.7	**4.1E+01**
Dioxin/Furans																
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	1.68E-05	7.5E-03	1.3E-07	2.2E+01	3.7E-04	Invertebrate	2.0E-06	2.0E-05	**8.4E+00**	8.4E-01	**Y**	1.16E-05	**5.8E+00**
TCL Pesticides/PCBs																
4,4'-DDE	72-55-9	5.80E-02	5.80E-01	0.0048	8.0E-02	3.8E-04	2.0E+01	9.6E-02	Invertebrate	9.1E-03	9.1E-02	5.3E-01	5.3E-02	N	--	--
4,4'-DDT	50-29-3	2.80E-03	2.80E-02	0.026	6.2E-01	1.6E-02	2.9E+01	7.6E-01	Invertebrate	3.0E-04	3.0E-03	**8.6E+01**	**8.6E+00**	**Y**	0.00751	**2.5E+01**
alpha-Chlordane	5103-71-9	2.14E+00	1.07E+01	0.0031	1.0E+00	3.1E-03	4.0E+00	1.2E-02	Invertebrate	1.7E+00	8.4E+00	1.8E-03	3.7E-04	N	--	--
delta-BHC	319-86-8	5.60E-01	2.25E+00	0.0005	1.0E+00	5.0E-04	3.2E+00	1.6E-03	Invertebrate	5.5E-01	2.2E+00	9.1E-04	2.3E-04	N	--	--
Endosulfan Sulfate	1031-07-8	1.00E+01	1.00E+02	0.0018	1.0E+00	1.8E-03	2.2E+00	4.0E-03	Invertebrate	1.4E+01	1.4E+02	1.3E-04	1.3E-05	N	--	--
Endrin Aldehyde	7421-93-4	2.80E-02	1.70E-01	0.0012	1.0E+00	1.2E-03	3.6E+00	4.3E-03	Invertebrate	2.4E-02	1.5E-01	4.9E-02	8.1E-03	N	--	--
gamma-BHC (Lindane)	58-89-9	2.00E+00	2.00E+01	0.0016	1.0E+00	1.6E-03	8.4E+00	1.3E-02	Invertebrate	7.5E-01	7.5E+00	2.1E-03	2.1E-04	N	--	--
gamma-Chlordane	5103-74-2	2.14E+00	1.06E+01	0.01	1.0E+00	1.0E-02	4.0E+00	4.0E-02	Invertebrate	1.7E+00	8.3E+00	6.0E-03	1.2E-03	N	--	--
Heptachlor	76-44-8	2.50E+00	1.25E+01	0.0048	1.0E+00	4.8E-03	3.0E+00	1.4E-02	Invertebrate	2.6E+00	1.3E+01	1.8E-03	3.7E-04	N	--	--
Heptachlor Epoxide	1024-57-3	9.90E-01	4.95E+00	0.11	1.0E+00	1.1E-01	8.4E+00	9.2E-01	Invertebrate	3.7E-01	1.9E+00	3.0E-01	5.9E-02	N	--	--
Methoxychlor	72-43-5	1.45E+01	1.45E+02	0.0074	1.0E+00	7.4E-03	3.4E+00	2.5E-02	Invertebrate	1.3E+01	1.3E+02	5.6E-04	5.6E-05	N	--	--
Aroclor1254	11097-69-1	4.10E-01	4.10E+00	0.2	6.8E-03	1.4E-03	1.6E+01	3.2E+00	Invertebrate	8.2E-02	8.2E-01	**2.5E+00**	2.5E-01	**Y**	0.0688	8.4E-01
Aroclor1260	11096-82-5	4.10E-01	4.10E+00	0.078	4.5E-03	3.5E-04	1.6E+01	1.2E+00	Invertebrate	8.2E-02	8.2E-01	9.6E-01	9.6E-02	N	--	--
PAHs																
Acenaphthene	83-32-9	1.01E+00	5.05E+00	1.6	4.6E+00	7.4E+00	2.7E+00	4.3E+00	Plant	6.9E-01	3.4E+00	**2.3E+00**	4.6E-01	**Y**	0.51	7.4E-01
Acenaphthylene	208-96-8	NV	NV	1.1	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	56-55-3	NV	NV	0.049	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	5.00E-01	2.50E+00	0.058	3.3E+00	1.9E-01	1.2E+00	7.2E-02	Plant	4.7E-01	2.4E+00	1.2E-01	2.4E-02	N	--	--
Benzo(b)fluoranthene	205-99-2	NV	NV	0.11	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	191-24-2	NV	NV	0.032	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	207-08-9	NV	NV	0.057	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	218-01-9	NV	NV	0.21	--	--	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	53-70-3	NV	NV	0.036	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	NV	NV	0.09	--	--	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	NV	NV	0.39	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.12	1.1E+01	1.3E+00	1.1E+00	1.3E-01	Plant	3.2E-01	1.6E+00	3.7E-01	7.4E-02	N	--	--
Pyrene	129-00-0	NV	NV	0.18	--	--	--	--	--	--	--	--	--	--	--	--
Explosives																
1,3,5-Trinitrobenzene	99-35-4	NV	NV	7.6	--	--	--	--	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	130	8.5E+00	1.1E+03	1.0E+00	1.3E+02	Plant	2.6E-02	6.7E-01	**5.0E+03**	**1.9E+02**	**Y**	13.6	**5.2E+02**
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	17	8.5E+00	1.4E+02	1.0E+00	1.7E+01	Plant	3.7E-02	4.7E-01	**4.6E+02**	**3.6E+01**	**Y**	1.65	**4.4E+01**
2,6-Dinitrotoluene	606-20-2	1.00E-01	1.25E+00	11	8.5E+00	9.3E+01	1.0E+00	1.1E+01	Plant	3.7E-02	4.7E-01	**2.9E+02**	**2.4E+01**	**Y**	1.13	**3.0E+01**
2-Amino-4,6-Dinitrotoluene	355-72-78-2	NV	NV	5.7	--	--	--	--	--	--	--	--	--	--	--	--
4-Amino-2,6-Dinitrotoluene	1946-51-0	NV	NV	5.2	--	--	--	--	--	--	--	--	--	--	--	--
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	2691-41-0	NV	NV	6.8	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

American Robin Specific Data from Table F.2-9

BW=	0.0635	kg
IR_{food} =	0.020	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00100	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-21
Refined Wildlife Risk Characterization - American Robin
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment								
				Soil								
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics												
Cadmium	7440-43-9	1.45E+00	2.00E+01	0.44	9.0E-01	4.0E-01	9.8E+00	4.3E+00	1.6E+00	2.2E+01	2.7E-01	2.0E-02
Chromium	7440-47-3	1.00E+00	5.00E+00	20.5	4.1E-02	8.4E-01	3.1E-01	6.3E+00	2.5E+01	1.3E+02	8.1E-01	1.6E-01
Lead	7439-92-1	1.13E+00	1.13E+01	110.7	3.4E-02	3.7E+00	3.2E-01	3.6E+01	2.8E+01	2.8E+02	**3.9E+00**	3.9E-01
Mercury	7439-97-6	4.50E-01	9.00E-01	0.122	9.6E-01	1.2E-01	1.7E+00	2.1E-01	1.7E+00	3.4E+00	7.2E-02	3.6E-02
Selenium	7782-49-2	4.00E-01	8.00E-01	1.134	5.1E-01	5.8E-01	9.0E-01	1.0E+00	2.7E+00	5.4E+00	4.2E-01	2.1E-01
Zinc	7440-66-6	1.45E+01	1.31E+02	145.7	5.2E-01	7.6E+01	3.0E+00	4.4E+02	4.6E+01	4.2E+02	**3.2E+00**	3.5E-01
Dioxin/Furans												
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	1.16E-05	6.5E-03	7.6E-08	1.1E+01	1.3E-04	1.6E-05	1.6E-04	7.3E-01	7.3E-02
TCL Pesticides/PCBs												
4,4'-DDT	50-29-3	2.80E-03	2.80E-02	0.00751	2.7E-01	2.0E-03	1.4E+01	1.1E-01	2.4E-03	2.4E-02	**3.1E+00**	3.1E-01
Aroclor1254	11097-69-1	4.10E-01	4.10E+00	0.0688	6.8E-03	4.7E-04	6.7E+00	4.6E-01	7.7E-01	7.7E+00	9.0E-02	9.0E-03
PAHs												
Acenaphthene	83-32-9	1.01E+00	5.05E+00	0.51	1.3E-02	6.8E-03	8.7E-01	4.4E-01	1.3E+01	6.3E+01	4.1E-02	8.1E-03
Explosives												
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	13.6	4.2E+00	5.8E+01	1.0E+00	1.4E+01	1.1E-01	2.8E+00	**1.2E+02**	**4.8E+00**
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	1.65	4.2E+00	7.0E+00	1.0E+00	1.7E+00	1.6E-01	2.0E+00	**1.0E+01**	8.3E-01
2,6-Dinitrotoluene	606-20-2	1.00E-01	1.25E+00	1.13	4.2E+00	4.8E+00	1.0E+00	1.1E+00	1.6E-01	2.0E+00	**7.1E+00**	5.7E-01

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10
BW = Average Body Weigth of Receptor (kg)
IR_{food} = Average Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor, specific to prey type and chemical
DF = Dietary fraction
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

American Robin Specific Data from Table F.2-9

BW=	0.0773	kg
IR_{food} =	0.016	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.62	unitless
DF_{inv} =	0.38	unitless
IR_{soil} =	0.0008	kg dw/day
AF =	1.000	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level
LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-22
Preliminary Wildlife Risk Characterization - Red-tailed Hawk
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics													
Arsenic	7440-38-2	5.14E+00	1.28E+01	2.5	1.5E-02	3.7E-02	5.2E+03	2.1E+03	4.8E-04	1.9E-04	N	--	--
Cadmium	7440-43-9	1.45E+00	2.00E+01	1.6	4.0E+00	6.4E+00	5.5E+00	4.0E-01	2.9E-01	2.1E-02	N	--	--
Chromium	7440-47-3	1.00E+00	5.00E+00	29.5	3.3E-01	9.8E+00	4.6E+01	9.1E+00	6.5E-01	1.3E-01	N	--	--
Copper	7440-50-8	4.70E+01	6.17E+01	84.1	1.0E+00	8.8E+01	6.8E+02	5.2E+02	1.2E-01	9.4E-02	N	--	--
Lead	7439-92-1	1.13E+00	1.13E+01	528	2.9E-01	1.5E+02	6.0E+01	6.0E+00	**8.8E+00**	8.8E-01	**Y**	110.7	**1.8E+00**
Mercury	7439-97-6	4.50E-01	9.00E-01	0.31	1.9E-01	6.0E-02	3.6E+01	1.8E+01	8.7E-03	4.4E-03	N	--	--
Nickel	7440-02-0	7.74E+01	1.07E+02	13.5	5.9E-01	8.0E+00	2.0E+03	1.4E+03	6.8E-03	4.9E-03	N	--	--
Selenium	7782-49-2	4.00E-01	8.00E-01	2	1.2E+00	2.4E+00	5.1E+00	2.6E+00	3.9E-01	2.0E-01	N	--	--
Silver	7440-22-4	1.66E+01	1.24E+02	0.089	5.0E-01	4.5E-02	5.0E+02	6.7E+01	1.8E-04	2.4E-05	N	--	--
Zinc	7440-66-6	1.45E+01	1.31E+02	337	2.7E+00	9.1E+02	8.2E+01	9.1E+00	**4.1E+00**	4.6E-01	**Y**	145.7	**1.8E+00**
Dioxin/Furans													
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	1.68E-05	2.2E+00	3.7E-05	9.7E-05	9.7E-06	1.7E-01	1.7E-02	N	--	--
TCL Pesticides/PCBs													
4,4'-DDE	72-55-9	5.80E-02	5.80E-01	0.0048	1.0E+00	4.8E-03	8.8E-01	8.8E-02	5.4E-03	5.4E-04	N	--	--
4,4'-DDT	50-29-3	2.80E-03	2.80E-02	0.026	1.0E+00	2.6E-02	4.3E-02	4.3E-03	6.1E-01	6.1E-02	N	--	--
alpha-Chlordane	5103-71-9	2.14E+00	1.07E+01	0.0031	1.0E+00	3.1E-03	3.3E+01	6.5E+00	9.5E-05	1.9E-05	N	--	--
delta-BHC	319-86-8	5.60E-01	2.25E+00	0.0005	1.0E+00	5.0E-04	8.5E+00	2.1E+00	5.9E-05	1.5E-05	N	--	--
Endosulfan Sulfate	1031-07-8	1.00E+01	1.00E+02	0.0018	1.0E+00	1.8E-03	1.5E+02	1.5E+01	1.2E-05	1.2E-06	N	--	--
Endrin Aldehyde	7421-93-4	2.80E-02	1.70E-01	0.0012	1.0E+00	1.2E-03	4.3E-01	7.0E-02	2.8E-03	4.6E-04	N	--	--
gamma-BHC (Lindane)	58-89-9	2.00E+00	2.00E+01	0.0016	1.0E+00	1.6E-03	3.0E+01	3.0E+00	5.3E-05	5.3E-06	N	--	--
gamma-Chlordane	5103-74-2	2.14E+00	1.06E+01	0.01	1.0E+00	1.0E-02	3.3E+01	6.6E+00	3.1E-04	6.2E-05	N	--	--
Heptachlor	76-44-8	2.50E+00	1.25E+01	0.0048	1.0E+00	4.8E-03	3.8E+01	7.6E+00	1.3E-04	2.5E-05	N	--	--
Heptachlor Epoxide	1024-57-3	9.90E-01	4.95E+00	0.11	1.0E+00	1.1E-01	1.5E+01	3.0E+00	7.3E-03	1.5E-03	N	--	--
Methoxychlor	72-43-5	1.45E+01	1.45E+02	0.0074	1.0E+00	7.4E-03	2.2E+02	2.2E+01	3.4E-05	3.4E-06	N	--	--
Aroclor1254	11097-69-1	4.10E-01	4.10E+00	0.2	1.0E+00	2.0E-01	6.2E+00	6.2E-01	3.2E-02	3.2E-03	N	--	--
Aroclor1260	11096-82-5	4.10E-01	4.10E+00	0.078	1.0E+00	7.8E-02	6.2E+00	6.2E-01	1.3E-02	1.3E-03	N	--	--
PAHs													
Acenaphthene	83-32-9	1.01E+00	5.05E+00	1.6	1.0E+00	1.6E+00	1.5E+01	3.1E+00	1.0E-01	2.1E-02	N	--	--
Acenaphthylene	208-96-8	NV	NV	1.1	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	56-55-3	NV	NV	0.049	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	5.00E-01	2.50E+00	0.058	1.0E+00	5.8E-02	7.6E+00	1.5E+00	7.6E-03	1.5E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	NV	NV	0.11	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	191-24-2	NV	NV	0.032	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	207-08-9	NV	NV	0.057	--	--	--	--	--	--	--	--	--
Chrysene	218-01-9	NV	NV	0.21	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	53-70-3	NV	NV	0.036	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	NV	NV	0.09	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	NV	NV	0.39	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.12	1.0E+00	1.2E-01	1.7E+01	3.4E+00	7.0E-03	1.4E-03	N	--	--
Pyrene	129-00-0	NV	NV	0.18	--	--	--	--	--	--	--	--	--
Explosives													
1,3,5-Trinitrobenzene	99-35-4	NV	NV	7.6	--	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	130	1.0E+00	1.3E+02	1.1E+00	4.1E-02	**1.2E+02**	**4.8E+00**	**Y**	13.6	**1.3E+01**
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	17	1.0E+00	1.7E+01	1.5E+00	1.2E-01	**1.1E+01**	9.0E-01	**Y**	1.65	**1.1E+00**
2,6-Dinitrotoluene	606-20-2	1.00E-01	1.25E+00	11	1.0E+00	1.1E+01	1.5E+00	1.2E-01	**7.2E+00**	5.8E-01	**Y**	1.13	7.4E-01
2-Amino-4,6-Dinitrotoluene	355-72-78-2	NV	NV	5.7	--	--	--	--	--	--	--	--	--
4-Amino-2,6-Dinitrotoluene	1946-51-0	NV	NV	5.2	--	--	--	--	--	--	--	--	--
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	2691-41-0	NV	NV	6.8	--	--	--	--	--	--	--	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW_i = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Red-tailed Hawk Specific Data from Table F.2-9

BW=	0.957	kg
IR_{food} =	0.063	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{mam} =	1.00	unitless
IR_{soil} =	0.00	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screenning levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-23
Refined Wildlife Risk Characterization - Red-tailed Hawk
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment						
				Soil						
				EPC (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Soil Screening Level[a] (mg/kg)	Calculated LOAEL-Based Soil Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics										
Lead	7439-92-1	1.13E+00	1.13E+01	110.7	7.8E-02	8.6E+00	1.0E+05	1.0E+06	1.1E-03	1.1E-04
Zinc	7440-66-6	1.45E+01	1.31E+02	145.7	7.7E-01	1.1E+02	1.4E+05	1.2E+06	1.1E-03	1.2E-04
Explosives										
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	13.6	0.0E+00	0.0E+00	--	--	--	--
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	1.65	0.0E+00	0.0E+00	--	--	--	--
2,6-Dinitrotoluene	606-20-2	1.00E-01	1.25E+00	1.13	0.0E+00	0.0E+00	--	--	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Red-tailed Hawk Specific Data from Table F.2-9

BW=	1.134	kg
IR_{food} =	0.059	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{mam} =	1.00	unitless
IR_{soil} =	0.0	kg dw/day
AF =	0.0027	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-24
Wildlife Summary
Screening Level Ecological Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS#	Meadow Vole					Short-tailed Shrew					Red Fox					American Robin					Red-tailed Hawk				
		Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ
Inorganics																										
Arsenic	7440-38-2	**1.4E+01**	**1.4E+00**	**8.3E+00**	1.7E-01	1.7E-02	**4.9E+00**	4.9E-01	**2.9E+00**	4.2E-01	4.2E-02	**9.1E+00**	9.1E-01	**5.4E+00**	7.5E-04	7.5E-05	1.8E-01	7.1E-02	NC	NC	NC	4.8E-04	1.9E-04	NC	NC	NC
Cadmium	7440-43-9	**1.8E+00**	1.8E-01	5.0E-01	5.2E-02	5.2E-03	**7.4E+00**	7.4E-01	**2.0E+00**	2.4E-01	2.4E-02	**1.5E+01**	**1.5E+00**	**4.1E+00**	2.9E-04	2.9E-05	**1.4E+01**	**1.0E+00**	**3.9E+00**	2.7E-01	2.0E-02	2.9E-01	2.1E-02	NC	NC	NC
Chromium	7440-47-3	3.3E-01	3.3E-02	NC	NC	NC	**3.2E+00**	3.2E-01	**2.2E+00**	1.5E-01	1.5E-02	**6.3E+00**	6.3E-01	**4.4E+00**	5.6E-04	5.6E-05	**3.0E+01**	**6.0E+00**	**2.1E+01**	8.1E-01	1.6E-01	6.5E-01	1.3E-01	NC	NC	NC
Copper	7440-50-8	**1.2E+00**	9.1E-01	2.9E-01	5.5E-02	4.2E-02	**1.0E+00**	7.6E-01	2.4E-01	4.9E-02	3.8E-02	**1.9E+00**	**1.4E+00**	4.5E-01	5.3E-04	4.0E-04	8.9E-01	6.8E-01	NC	NC	NC	1.2E-01	9.4E-02	NC	NC	NC
Lead	7439-92-1	**1.1E+01**	**1.1E+00**	**2.3E+00**	9.8E-02	9.8E-03	**1.2E+01**	**1.2E+00**	**2.5E+00**	3.5E-01	3.5E-02	**2.2E+01**	**2.2E+00**	**4.7E+00**	1.0E-03	1.0E-04	**2.3E+02**	**2.3E+01**	**4.9E+01**	**3.9E+00**	3.9E-01	**8.8E+00**	8.8E-01	**1.8E+00**	1.1E-03	1.1E-04
Mercury	7439-97-6	3.0E-02	3.0E-03	NC	NC	NC	4.1E-02	4.1E-03	NC	NC	NC	8.2E-02	8.2E-03	NC	NC	NC	**4.5E+00**	**2.2E+00**	**1.8E+00**	7.2E-02	3.6E-02	8.7E-03	4.4E-03	NC	NC	NC
Nickel	7440-02-0	1.6E-01	8.1E-02	NC	NC	NC	1.8E-01	9.0E-02	NC	NC	NC	3.5E-01	1.8E-01	NC	NC	NC	2.6E-01	1.9E-01	NC	NC	NC	6.8E-03	4.9E-03	NC	NC	NC
Selenium	7782-49-2	**1.0E+01**	**6.2E+00**	**5.8E+00**	3.8E-01	2.3E-01	**3.4E+00**	**2.1E+00**	**1.9E+00**	3.3E-01	2.0E-01	**6.7E+00**	**4.1E+00**	**3.8E+00**	2.5E-03	1.5E-03	**4.8E+00**	**2.4E+00**	**2.7E+00**	4.2E-01	2.1E-01	3.9E-01	2.0E-01	NC	NC	NC
Silver	7440-22-4	8.2E-05	8.2E-06	NC	NC	NC	6.8E-03	6.8E-04	NC	NC	NC	1.4E-02	1.4E-03	NC	NC	NC	2.6E-02	3.5E-03	NC	NC	NC	1.8E-04	2.4E-05	NC	NC	NC
Zinc	7440-66-6	**1.3E+00**	6.5E-01	5.6E-01	6.1E-02	3.1E-02	**3.0E+00**	**1.5E+00**	**1.3E+00**	1.5E-01	7.7E-02	**6.0E+00**	**3.0E+00**	**2.6E+00**	5.4E-04	2.7E-04	**9.5E+01**	**1.0E+01**	**4.1E+01**	**3.2E+00**	3.5E-01	**4.1E+00**	4.6E-01	**1.8E+00**	1.1E-03	1.2E-04
Dioxin/Furans																										
Total 2,3,7,8-TCDD Equivalents	1746-01-6	3.3E-01	3.3E-02	NC	NC	NC	**7.7E+01**	**7.7E+00**	**4.3E+01**	**1.0E+01**	1.0E+00	**1.5E+03**	**1.5E+02**	**8.7E+01**	1.3E-02	1.3E-03	**8.4E+00**	8.4E-01	**5.8E+00**	7.3E-01	7.3E-02	1.7E-01	1.7E-02	NC	NC	NC
TCL Pesticides/PCBs																										
4,4'-DDE	72-55-9	7.3E-06	7.3E-07	NC	NC	NC	4.6E-04	4.6E-05	NC	NC	NC	9.2E-04	9.2E-05	NC	NC	NC	5.3E-01	5.3E-02	NC	NC	NC	5.4E-03	5.4E-04	NC	NC	NC
4,4'-DDT	50-29-3	7.0E-03	1.4E-03	NC	NC	NC	1.0E-01	2.1E-02	NC	NC	NC	2.1E-01	4.2E-02	NC	NC	NC	**8.6E+01**	**8.6E+00**	**2.5E+01**	**3.1E+00**	3.1E-01	6.1E-01	6.1E-02	NC	NC	NC
alpha-Chlordane	5103-71-9	5.0E-03	5.0E-04	NC	NC	NC	6.6E-03	6.6E-04	NC	NC	NC	1.3E-02	1.3E-03	NC	NC	NC	1.8E-03	3.7E-04	NC	NC	NC	9.5E-05	1.9E-05	NC	NC	NC
delta-BHC	319-86-8	9.4E-03	9.4E-04	NC	NC	NC	9.9E-03	9.9E-04	NC	NC	NC	1.9E-02	1.9E-03	NC	NC	NC	9.1E-04	2.3E-04	NC	NC	NC	5.9E-05	1.5E-05	NC	NC	NC
Endosulfan Sulfate	1031-07-8	2.4E-02	2.4E-03	NC	NC	NC	1.8E-02	1.8E-03	NC	NC	NC	3.4E-02	3.4E-03	NC	NC	NC	1.3E-04	1.3E-05	NC	NC	NC	1.2E-05	1.2E-06	NC	NC	NC
Endrin Aldehyde	7421-93-4	8.3E-03	8.3E-04	NC	NC	NC	9.8E-03	9.8E-04	NC	NC	NC	1.9E-02	1.9E-03	NC	NC	NC	4.9E-02	8.1E-03	NC	NC	NC	2.8E-03	4.6E-04	NC	NC	NC
gamma-BHC (Lindane)	58-89-9	6.9E-05	6.9E-06	NC	NC	NC	1.9E-04	1.9E-05	NC	NC	NC	3.7E-04	3.7E-05	NC	NC	NC	2.1E-03	2.1E-04	NC	NC	NC	5.3E-05	5.3E-06	NC	NC	NC
gamma-Chlordane	5103-74-2	1.6E-02	1.6E-03	NC	NC	NC	2.1E-02	2.1E-03	NC	NC	NC	4.2E-02	4.2E-03	NC	NC	NC	6.0E-03	1.2E-03	NC	NC	NC	3.1E-04	6.2E-05	NC	NC	NC
Heptachlor	76-44-8	1.3E-02	1.3E-03	NC	NC	NC	1.3E-02	1.3E-03	NC	NC	NC	2.5E-02	2.5E-03	NC	NC	NC	1.8E-03	3.7E-04	NC	NC	NC	1.3E-04	2.5E-05	NC	NC	NC
Heptachlor Epoxide	1024-57-3	**1.5E+00**	1.5E-01	3.2E-01	8.4E-03	8.4E-04	**4.1E+00**	4.1E-01	8.6E-01	4.1E-01	4.1E-02	**8.1E+00**	8.1E-01	**1.7E+00**	7.5E-04	7.5E-05	3.0E-01	5.9E-02	NC	NC	NC	7.3E-03	1.5E-03	NC	NC	NC
Methoxychlor	72-43-5	6.4E-04	3.2E-04	NC	NC	NC	7.2E-04	3.6E-04	NC	NC	NC	1.4E-03	7.0E-04	NC	NC	NC	5.6E-04	5.6E-05	NC	NC	NC	3.4E-05	3.4E-06	NC	NC	NC
Aroclor1254	11097-69-1	5.6E-02	5.6E-03	NC	NC	NC	**9.5E+00**	9.5E-01	**3.3E+00**	6.7E-01	6.7E-02	**1.9E+01**	**1.9E+00**	**6.5E+00**	1.4E-03	1.4E-04	**2.5E+00**	2.5E-01	8.4E-01	9.0E-02	9.0E-03	3.2E-02	3.2E-03	NC	NC	NC
Aroclor1260	11096-82-5	2.0E-02	2.0E-03	NC	NC	NC	**3.7E+00**	3.7E-01	9.5E-01	1.9E-01	1.9E-02	**7.4E+00**	7.4E-01	**1.9E+00**	4.1E-04	4.1E-05	9.6E-01	9.6E-02	NC	NC	NC	1.3E-02	1.3E-03	NC	NC	NC
PAHs																										
Acenaphthene	83-32-9	2.6E-01	5.2E-02	NC	NC	NC	8.7E-02	1.7E-02	NC	NC	NC	1.7E-01	3.4E-02	NC	NC	NC	**2.3E+00**	4.6E-01	7.4E-01	4.1E-02	8.1E-03	1.0E-01	2.1E-02	NC	NC	NC
Acenaphthylene	208-96-8	1.7E-02	3.4E-03	NC	NC	NC	1.6E-02	3.3E-03	NC	NC	NC	3.3E-02	6.5E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(a)anthracene	56-55-3	5.6E-02	5.6E-03	NC	NC	NC	4.0E-02	4.0E-03	NC	NC	NC	7.5E-02	7.5E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(a)pyrene	50-32-8	1.2E-01	1.2E-02	NC	NC	NC	4.0E-02	4.0E-03	NC	NC	NC	7.8E-02	7.8E-03	NC	NC	NC	1.2E-01	2.4E-02	NC	NC	NC	7.6E-03	1.5E-03	NC	NC	NC
Benzo(b)fluoranthene	205-99-2	3.4E-02	3.4E-03	NC	NC	NC	5.4E-02	5.4E-03	NC	NC	NC	1.0E-01	1.0E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(g,h,i)perylene	191-24-2	6.4E-02	1.3E-02	NC	NC	NC	4.7E-02	9.4E-03	NC	NC	NC	9.2E-02	1.8E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(k)fluoranthene	207-08-9	3.3E-03	3.3E-04	NC	NC	NC	2.0E-03	2.0E-04	NC	NC	NC	3.8E-03	3.8E-04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chrysene	218-01-9	9.2E-03	9.2E-04	NC	NC	NC	4.9E-03	4.9E-04	NC	NC	NC	9.3E-03	9.3E-04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Dibenz(a,h)anthracene	53-70-3	2.8E-03	2.8E-04	NC	NC	NC	7.5E-03	7.5E-04	NC	NC	NC	1.4E-02	1.4E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoranthene	206-44-0	1.1E-02	2.2E-03	NC	NC	NC	3.6E-03	7.3E-04	NC	NC	NC	7.2E-03	1.4E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Indeno(1,2,3-cd)pyrene	193-39-5	3.8E-03	3.8E-04	NC	NC	NC	1.7E-02	1.7E-03	NC	NC	NC	3.2E-02	3.2E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Phenanthrene	85-01-8	1.2E-01	2.3E-02	NC	NC	NC	3.9E-02	7.7E-03	NC	NC	NC	7.7E-02	1.5E-02	NC	NC	NC	3.7E-01	7.4E-02	NC	NC	NC	7.0E-03	1.4E-03	NC	NC	NC
Pyrene	129-00-0	5.2E-02	1.0E-02	NC	NC	NC	1.7E-02	3.5E-03	NC	NC	NC	3.4E-02	6.9E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Explosives																										
1,3,5-Trinitrobenzene	99-35-4	**8.2E+00**	**1.7E+00**	**1.4E+00**	2.6E-01	5.3E-02	**2.7E+00**	5.5E-01	4.7E-01	4.8E-02	9.7E-03	**5.4E+00**	**1.1E+00**	9.4E-01	2.8E-04	5.5E-05	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
2,4,6-Trinitrotoluene	118-96-7	**7.4E+01**	**1.8E+01**	**7.7E+00**	**1.4E+00**	3.5E-01	**2.4E+01**	**6.1E+00**	**2.5E+00**	2.6E-01	6.5E-02	**4.8E+01**	**1.2E+01**	**5.0E+00**	1.5E-03	3.7E-04	**5.0E+03**	**1.9E+02**	**5.2E+02**	**1.2E+02**	**4.8E+00**	**1.2E+02**	**4.8E+00**	**1.3E+01**	--	--
2,4-Dinitrotoluene	121-14-2	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	**4.6E+02**	**3.6E+01**	**4.4E+01**	**1.0E+01**	8.3E-01	**1.1E+01**	9.0E-01	**1.1E+00**	--	--
2,6-Dinitrotoluene	606-20-2	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	**2.9E+02**	**2.4E+01**	**3.0E+01**	**7.1E+00**	5.7E-01	**7.2E+00**	5.8E-01	7.4E-01	--	--
2-Amino-4,6-Dinitrotoluene	355-72-78-2	**1.8E+00**	3.4E-01	2.0E-01	3.7E-02	7.0E-03	6.1E-01	1.1E-01	NC	NC	NC	**1.2E+00**	2.3E-01	1.3E-01	3.9E-05	7.3E-06	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
4-Amino-2,6-Dinitrotoluene	1946-51-0	**1.7E+00**	3.1E-01	1.8E-01	3.3E-02	6.2E-03	5.5E-01	1.0E-01	NC	NC	NC	**1.1E+00**	2.1E-01	1.2E-01	3.5E-05	6.5E-06	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5	2691-41-0	**2.4E+00**	3.4E-01	2.5E-01	7.8E-03	1.1E-03	7.9E-01	1.1E-01	NC	NC	NC	**1.6E+00**	2.2E-01	1.6E-01	1.4E-05	2.0E-06	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
CAS = Chemical Abstract Services
NC = Not Calculated
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
HQ = Hazard Quotient
EPC = Exposure Point Concentration
-- = Refined Mammal BAF is 0; therefore, bioaccumulation of these chemicals not a concern for the red-tailed hawk

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APPENDIX F.3

AREA B SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

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Table F.3-1
SLERA Occurence/Distribution - Area B Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits
TAL Metals							
Aluminum	7429-90-5	8,690	22,600	mg/kg	54SB49A	17/17	2.3 - 7.1
Antimony	7440-36-0	0.44	1.9	mg/kg	54SB46A (E)	7/15	0.14 - 0.68
Arsenic	7440-38-2	0.44	5.1	mg/kg	54SB46A (E)	17/17	0.27 - 0.46
Barium	7440-39-3	91.9	241	mg/kg	54SB51A	17/17	0.02 - 0.04
Beryllium	7440-41-7	0.61	1.1	mg/kg	54SB49A	17/17	0.01 - 0.03
Cadmium	7440-43-9	0.05	0.64	mg/kg	54SB46A (E)	3/17	0.03 - 0.07
Calcium	7440-70-2	636	14,900	mg/kg	54SB46A (E)	17/17	1 - 1.9
Chromium	7440-47-3	14.8	41.6	mg/kg	54SB49A	17/17	0.06 - 0.11
Cobalt	7440-48-4	6.1	12.2	mg/kg	54SB49A	17/17	0.06 - 0.11
Copper	7440-50-8	3.3	195	mg/kg	54SB46A (E)	17/17	0.15 - 0.26
Iron	7439-89-6	13,200	35,100	mg/kg	54SB49A	17/17	1.4 - 2.5
Lead	7439-92-1	7.4	3,610	mg/kg	54SB46A (E)	17/17	0.14 - 0.42
Magnesium	7439-95-4	1,120	9,040	mg/kg	54SB46A (E)	17/17	0.65 - 1.5
Manganese	7439-96-5	296	883.5	mg/kg	54SB42A DUP AVG (C)	17/17	0.02 - 0.04
Mercury	7439-97-6	0.02	0.77	mg/kg	54SB46A (E)	17/17	0.018 - 0.031
Nickel	7440-02-0	7	19.3	mg/kg	54SB49A	17/17	0.11 - 0.18
Potassium	7440-09-7	749	2,880	mg/kg	54SB49A	17/17	4.5 - 21.7
Selenium	7782-49-2	0.56	2.6	mg/kg	54SB49A	17/17	0.34 - 0.6
Silver	7440-22-4	0.11	0.11	mg/kg	54SB46A (E)	1/17	0.07 - 0.13
Sodium	7440-23-5	67.6	1,270	mg/kg	54SB49A	16/17	26.6 - 45.5
Vanadium	7440-62-2	23	58.9	mg/kg	54SB49A	17/17	0.07 - 0.13
Zinc	7440-66-6	47.1	555	mg/kg	54SB46A (E)	17/17	0.11 - 0.18
TCL Pesticides/PCBs							
4,4'-DDE	72-55-9	7.6E-03	6.0E-02	mg/kg	54SB46A (E)	2/10	0.0004 - 0.00392
alpha-Chlordane	5103-71-9	6.2E-02	6.2E-02	mg/kg	54SB46A (E)	1/10	0.00022 - 0.00305
delta-BHC	319-86-8	6.0E-03	6.0E-03	mg/kg	54SB49A	1/10	0.00015 - 0.00265
Dieldrin	60-57-1	1.1E-02	1.1E-02	mg/kg	54SB46A (E)	1/10	0.00043 - 0.0032
Endrin aldehyde	7421-93-4	4.4E-03	4.4E-03	mg/kg	54SB73A	1/10	0.00035 - 0.00295
Endrin ketone	53494-70-5	7.5E-03	7.5E-03	mg/kg	54SB49A	1/10	0.00039 - 0.00311
gamma-Chlordane	5103-74-2	5.5E-02	5.5E-02	mg/kg	54SB46A (E)	1/10	0.00035 - 0.00311
Heptachlor	76-44-8	1.3E-03	1.3E-03	mg/kg	54SB46A (E)	1/10	0.00034 - 0.00335
Heptachlor epoxide	1024-57-3	5.9E-03	2.1E-02	mg/kg	54SB46A (E)	2/10	0.00026 - 0.00471
Methoxychlor	72-43-5	3.0E-03	3.0E-03	mg/kg	54SB49A	1/10	0.0014 - 0.00634
Aroclor 1254	11097-69-1	1.5E-02	2.8E+00	mg/kg	54SB46A (E)	5/10	0.0072 - 0.073
Aroclor 1260	11096-82-5	2.4E-02	3.8E-01	mg/kg	54SB46A (E)	2/10	0.0053 - 0.0141
TCL SVOCs							
Bis(2-ethylhexyl)phthalate	117-81-7	5.0E-02	1.4E+00	mg/kg	54SB46A (E)	10/17	0.032 - 0.032
Di-n-butylphthalate	84-74-2	4.4E-02	1.1E+01	mg/kg	54SB46A (E)	6/17	0.38 - 6
Diethylphthalate	84-66-2	3.6E-02	9.6E+01	mg/kg	54SB46A (E)	9/17	0.38 - 6
Dimethylphthalate	131-11-3	1.2E+00	1.9E+00	mg/kg	54SB46A (E)	2/17	0.38 - 6
N-Nitrosodiphenylamine	86-30-6	1.1E-01	1.8E+00	mg/kg	54SB46A (E)	4/17	0.38 - 6
Dioxin/Furans							
Total 2,3,7,8-TCDD TEQ (Mammalian)	--	6.4E-07	1.8E-04	mg/kg	54SB49A	18/18	--
Total 2,3,7,8-TCDD TEQ (Avian)	--	1.3E-08	3.2E-04	mg/kg	54SB49A	18/18	--
PAHs							
Acenaphthene	83-32-9	3.4E-02	3.5E+00	mg/kg	54SB43A (F)	5/17	0.0058 - 0.0059
Acenaphthylene	208-96-8	2.4E-01	2.4E-01	mg/kg	54SB49A	1/17	0.0059 - 0.0059
Benzo(a)anthracene	56-55-3	5.6E-03	1.5E-02	mg/kg	54SB49A	3/17	0.0022 - 0.0022
Benzo(a)pyrene	50-32-8	6.9E-03	5.7E-02	mg/kg	54SB49A	3/17	0.0016 - 0.0016
Benzo(b)fluoranthene	205-99-2	5.0E-03	1.0E-01	mg/kg	54SB49A	7/17	0.0017 - 0.0017
Benzo(g,h,i)perylene	191-24-2	6.5E-03	8.4E-02	mg/kg	54SB50A (D)	2/17	0.0036 - 0.0036
Benzo(k)fluoranthene	207-08-9	6.7E-03	3.2E-02	mg/kg	54SB49A	3/17	0.0014 - 0.0036
Chrysene	218-01-9	1.3E-02	4.2E-02	mg/kg	54SB49A	3/17	0.0014 - 0.0024
Dibenz(a,h)anthracene	53-70-3	8.9E-03	8.9E-03	mg/kg	54SB43A (F)	1/17	0.0024 - 0.0042
Fluoranthene	206-44-0	4.3E-03	7.2E-02	mg/kg	54SB49A	8/17	0.0021 - 0.0042
Indeno(1,2,3-cd)pyrene	193-39-5	3.5E-02	3.5E-02	mg/kg	54SB43A (F)	1/17	0.0025 - 0.014
Naphthalene	91-20-3	8.9E-02	8.6E+00	mg/kg	54SB49A	5/17	0.0025 - 0.014
Phenanthrene	85-01-8	2.1E-02	2.5E-02	mg/kg	54SB49A	2/17	0.0085 - 0.0085
Pyrene	129-00-0	1.0E-02	6.5E-02	mg/kg	54SB50A (D)	8/17	0.0043 - 0.0043
Explosives							
1,3,5-Trinitrobenzene	99-35-4	1.9E+00	1.9E+00	mg/kg	54SB49A	1/1	0.079 - 0.079
2,4,6-Trinitrotoluene	118-96-7	4.5E-01	8.0E+01	mg/kg	54SB49A	3/17	0.16 - 0.16
2,4-Dinitrotoluene	121-14-2	3.8E-01	1.1E+01	mg/kg	54SB46A (E)	2/17	0.12 - 0.12
2-Amino-4,6-Dinitrotoluene	35572-78-2	9.6E+00	9.6E+00	mg/kg	54SB46A (E)	1/17	0.1 - 0.1
4-Amino-2,6-Dinitrotoluene	1946-51-0	1.4E+01	1.4E+01	mg/kg	54SB46A (E)	1/17	0.095 - 0.095
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	8.2E+00	8.2E+00	mg/kg	54SB49A	1/17	0.28 - 0.28
Nitroglycerin							
Nitroglycerin	55-63-0	9.5E+01	4.0E+02	mg/kg	54SB46A (E)	2/17	0.1 - 1

Table F.3-1
SLERA Occurence/Distribution - Area B Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon

(C) = Re-sampled; Pesticides, PCBs, and Dioxin/Furans analyzed January 2007.
(D) = Re-sampled; Dioxin/Furans analyzed January 2007.
(E) = Re-sampled; PCBs and PCB Congeners analyzed January 2007.
(F) = Re-sampled; PCBs, PCB Congeners, and Dioxin/Furans analyzed January 2007.

Refer to Table 7-11 for Total 2,3,7,8-TCDD TEQ Calculations

Table F.3-2
Area B Dioxin/Furan Equivalents
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	Mammalian TEF	Avian TEF	54SB39A [D] 12/10/2002 0-1		54SB40A [D] 12/10/2002 0-1		54SB41A [D] 12/10/2002 0-1		54SB42A DUP AVG [C] 12/10/2002 0-1		54SB43A [F] 12/4/2002 0.5-1		54SB45A [D] 12/2/2002 0-1	
			Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
Dioxin/Furans (pg/g)														
1,2,3,4,6,7,8,9-OCDD (OCDD)	0.0003	0.0001	68.4	A	234	,J,i	440		3,760		1,860		70	
1,2,3,4,6,7,8,9-OCDF (OCDF)	0.0003	0.0001	<11.9	U	6.96	A,J,i	<0.92	U	23.45		216		0.382	A,B,z
1,2,3,4,6,7,8-HpCDD	0.01	0.001	4.01	A	10.1		10		66.95		210		1.83	A
1,2,3,4,6,7,8-HpCDF	0.01	0.01	<5.96	U	2.88	A	1.01	A	10.83		86.9		0.223	A,J,w
1,2,3,4,7,8,9-HpCDF	0.01	0.01	<5.96	U	<0.49	U	<0.46	U	1.8015	A	6.24		<0.397	U
1,2,3,4,7,8-HxCDD	0.1	0.05	<5.96	U	0.198	A	0.291	A,J,w	1.6505	A	3.22	A	<0.494	U
1,2,3,4,7,8-HxCDF	0.1	0.1	<5.96	U	0.407	A	0.154	A,J,w	1.89	A	10.7		<0.397	U
1,2,3,6,7,8-HxCDD	0.1	0.01	<5.96	U	0.46	A	<0.46	U	1.735	A	8.89		<0.505	U
1,2,3,6,7,8-HxCDF	0.1	0.1	<5.96	U	0.372	A	0.162	A,J,w	1.225	A	8.08		<0.397	U
1,2,3,7,8,9-HxCDD	0.1	0.1	<5.96	U	0.453	A	0.36	A	2.0725	A	8.34		<0.545	U
1,2,3,7,8,9-HxCDF	0.1	0.1	<5.96	U	<0.49	U	<0.46	U	1.593	A	2.51	A	<0.397	U
1,2,3,7,8-PeCDD	1	1	<5.96	U	<0.49	U	<0.46	U	1.5575	A,J,w	<0.49	U	<0.397	U
1,2,3,7,8-PeCDF	0.03	0.1	1.05	A	0.231	A	0.143	A,J,w	1.592	A	6.49		<0.397	U
2,3,4,6,7,8-HxCDF	0.1	0.1	<5.96	U	0.646	A,J,w	0.232	A,B,z	1.3015	A,J,w	8.97		<0.397	U
2,3,4,7,8-PeCDF	0.3	1	0.858	A	0.474	A	0.241	A,B,z	1.445	A	7.69		<0.397	U
2,3,7,8-TCDD	1	1	<1.19	U	0.733	A	1.26		0.3595	A,J,w	1.05		<0.0795	U
2,3,7,8-TCDF	0.1	1	6.1	A	0.57	A,B,z	<0.217	U	3.3865	A,J,f	9.85		0.221	A
Total 2,3,7,8-TCDD Equivalents (Mammalian)			0.960		1.338		1.603		5.815		13.262		0.064	
Total 2,3,7,8-TCDD Equivalents (Avian)			7.074		1.495		1.421		8.387		24.698		0.232	

Table F.3-2
Area B Dioxin/Furan Equivalents
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Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	Mammalian TEF	Avian TEF	54SB46A [E] 12/4/2002 0.5-1		54SB47A DUP AVG[D] 12/9/2002 0-1		54SB48A 12/9/2002 0-1		54SB49A 12/4/2002 1-2		54SB50A [D] 12/9/2002 0-1		54SB53A [D] 12/10/2002 0-1	
			Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
Dioxin/Furans (pg/g)														
1,2,3,4,6,7,8,9-OCDD (OCDD)	0.0003	0.0001	17,790		2,440		4,230	E,J,c	5,700	J,i	656		651	
1,2,3,4,6,7,8,9-OCDF (OCDF)	0.0003	0.0001	2,060	J,c	1.36	A,B,z	435	J,c	1,060	J,c	8.16	A	222	
1,2,3,4,6,7,8-HpCDD	0.01	0.001	3,090		24.8		495		1,560	J,i	21.6		58	
1,2,3,4,6,7,8-HpCDF	0.01	0.01	1,030		0.937		147		870		4.16	A	79.6	
1,2,3,4,7,8,9-HpCDF	0.01	0.01	54.9		<0.506	U	14.1		47.4		0.309	A	10.5	
1,2,3,4,7,8-HxCDD	0.1	0.05	62.7		0.281	A	7.6		43.6		0.311	A	0.835	A
1,2,3,4,7,8-HxCDF	0.1	0.1	116		<0.506	U	26.3		197		0.408	A	8.34	
1,2,3,6,7,8-HxCDD	0.1	0.01	154		0.423	A	18.8		153		0.643	A	2.41	A
1,2,3,6,7,8-HxCDF	0.1	0.1	57		0.123	A,B,z	11.4		87.5		0.318	A,B,z	4.64	
1,2,3,7,8,9-HxCDD	0.1	0.1	163		0.747	A	21		147		0.821	A,J,w	2.33	A
1,2,3,7,8,9-HxCDF	0.1	0.1	3.3	J	<0.506	U	<5		5.5		0.123	A,B,z	2.39	A
1,2,3,7,8-PeCDD	1	1	34.5	J,c	<0.506	U	5		36.9	J,c	<0.58	U	<0.453	U
1,2,3,7,8-PeCDF	0.03	0.1	<5		0.105	A	7.4		<5		0.2	A	1.18	A
2,3,4,6,7,8-HxCDF	0.1	0.1	57		0.168	A,B,z	12.3		89.6		0.429	A,J,w	3.5	A
2,3,4,7,8-PeCDF	0.3	1	29.6		0.152	A,B,z	11.9		82.3		0.306	A,J,w	1.55	A
2,3,7,8-TCDD	1	1	5.9		<0.101	U	1.3		10		<0.154	U	0.454	A
2,3,7,8-TCDF	0.1	1	43		0.293	A	9.6		125	J,i	0.61	A	1.28	
Total 2,3,7,8-TCDD Equivalents (Mammalian)			162.584		1.167		28.753		183.212		0.880		5.270	
Total 2,3,7,8-TCDD Equivalents (Avian)			173.229		0.675		38.781		321.98		1.256		6.634	

Table F.3-2
Area B Dioxin/Furan Equivalents
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Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	Mammalian TEF	Avian TEF	54SB54A [(D)] 12/9/2002 0-1		54SB55A 12/9/2002 0-1		54SB77A 1/9/2007 0-0.5		54SB78A 1/9/2007 0-0.5		54SB79A 1/9/2007 0-0.5		54SB80A 1/9/2007 0-0.5	
			Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
Dioxin/Furans (pg/g)														
1,2,3,4,6,7,8,9-OCDD (OCDD)	0.0003	0.0001	122		1,210	J,c	120		109		66.3		369	
1,2,3,4,6,7,8,9-OCDF (OCDF)	0.0003	0.0001	<1.04	U	211	J,c	2	A	1.25	A,B,z	0.558	A	0.766	A
1,2,3,4,6,7,8-HpCDD	0.01	0.001	2.94	A	204		5.76		5.5		2.39	A	8.82	
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.376	A,J,w	125		1.19	A	1.08	A	0.335	A	0.557	A
1,2,3,4,7,8,9-HpCDF	0.01	0.01	<0.522	U	16.1		<0.412	U	<0.468	U	<0.517	U	<0.516	U
1,2,3,4,7,8-HxCDD	0.1	0.05	<0.615	U	8.5		<0.412	U	0.159	A	<0.517	U	<0.516	U
1,2,3,4,7,8-HxCDF	0.1	0.1	<0.522	U	91.6		0.183	A,J,w	<0.468	U	<0.517	U	<0.516	U
1,2,3,6,7,8-HxCDD	0.1	0.01	<0.628	U	14.3		<0.412	U	0.271	A	0.13	A,J,w	0.221	A
1,2,3,6,7,8-HxCDF	0.1	0.1	<0.522	U	40.4		0.135	A,J,w	<0.468	U	<0.517	U	0.0867	A
1,2,3,7,8,9-HxCDD	0.1	0.1	<0.678	U	22.7		<0.412	U	<0.468	U	0.178	A,J,w	0.213	A
1,2,3,7,8,9-HxCDF	0.1	0.1	<0.522	U	5.7		<0.412	U	<0.468	U	<0.517	U	<0.516	U
1,2,3,7,8-PeCDD	1	1	<0.522	U	9.9		<0.412	U	<0.468	U	<0.517	U	<0.516	U
1,2,3,7,8-PeCDF	0.03	0.1	<0.522	U	37.5		0.135	A	0.14	A	0.112	A	<0.516	U
2,3,4,6,7,8-HxCDF	0.1	0.1	<0.522	U	38.6		0.147	A	<0.468	U	<0.517	U	0.12	A,J,w
2,3,4,7,8-PeCDF	0.3	1	0.071	A,B,z	56.7		0.193	A	0.212	A,B,z	0.134	A	0.159	A,J,w
2,3,7,8-TCDD	1	1	<0.104	U	2.7		1.34		1.76		0.703	A	0.237	A,J,w
2,3,7,8-TCDF	0.1	1	0.265	A	28.5		0.39	A,J,w	0.5	A	0.647	A,B,z	0.706	A,B,z
Total 2,3,7,8-TCDD Equivalents (Mammalian)			0.096		59.642		1.594		1.969		0.825		0.553	
Total 2,3,7,8-TCDD Equivalents (Avian)			0.284		123.775		2.013		2.024		0.880		0.492	

Notes:

pg/g = Picogram Per Gram
ft/bgs = Feet Below Ground Surface
TEF = Toxicity Equivalency Factor
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code

Total 2,3,7,8-TCDD Equivalents are calculated by summing the detected concentration times the TEF for each chemical. Non-detects, R-flagged data, and B-flagged data are excluded from summed total.

Qualifiers:

- A Amount detected is less than the Lower Calibration Limit.
- B Not detected substantially above the level reported in laboratory or field blanks.
- E Concentration exceeded the upper level of the calibration range of the instrument for that specific analysis.
- J Analyte present. Reported value may not be accurate or precise.
- U The compound was analyzed for but not detected. The reporting limit will be adjusted to reflect any dilution, and for soil, the percent moisture.
- c Calibration failure; poor (RRF) or unstable (%D) response
- q Concentration exceeded the linear range
- w Identification criteria failure
- z Method blank and/or storage blank contamination

Table F.3-3
Non-detected Chemicals MDL Screening for Area B - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
TAL Metals																	
ANTIMONY	7440-36-0	mg/kg	10	0.4	0.49	5	F	N	78	A	N	--	--	NS	0.27	A	**Y**
CADMIUM	7440-43-9	mg/kg	14	0.03	0.07	32	A	N	140	A	N	0.77	A	N	0.36	A	N
SILVER	7439-97-6	mg/kg	16	0.07	0.13	0.3	F	N	0.1	B	**Y**	--	--	NS	--	--	NS
SODIUM	7440-22-4	mg/kg	1	35	35	560	A	N	50	E	N	4.2	A	**Y**	14	A	**Y**
THALLIUM	7440-23-5	mg/kg	17	0.27	0.93	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Pesticides/PCBs																	
4,4'-DDD	72-54-8	ug/kg	10	0.32	3.25	100	G	N	100	C	N	--	--	NS	--	--	NS
4,4'-DDE	72-55-9	ug/kg	8	0.4	3.92	100	G	N	100	C	N	--	--	NS	--	--	NS
4,4'-DDT	50-29-3	ug/kg	10	0.39	3.66	100	G	N	100	C	N	93	A	N	21	A	N
ALDRIN	309-00-2	ug/kg	10	0.17	3.06	100	G	N	100	C	N	--	--	NS	--	--	NS
ALPHA-BHC	319-84-6	ug/kg	10	0.26	3.43	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
ALPHA-CHLORDANE	5103-71-9	ug/kg	9	0.22	3.05	100	G	N	100	C	N	--	--	NS	--	--	NS
BETA-BHC	319-85-7	ug/kg	10	0.28	4.26	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
DELTA-BHC	319-86-8	ug/kg	9	0.15	2.65	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
DIELDRIN	60-57-1	ug/kg	9	0.43	3.2	100	G	N	100	C	N	22	A	N	4.9	A	N
ENDOSULFAN I	959-98-8	ug/kg	10	0.43	3.56	--	--	NS	--	--	NS	--	--	NS	--	--	NS
ENDOSULFAN II	33213-65-9	ug/kg	10	0.58	2.14	--	--	NS	--	--	NS	--	--	NS	--	--	NS
ENDOSULFAN SULFATE	1031-07-8	ug/kg	10	0.4	3.65	--	--	NS	--	--	NS	--	--	NS	--	--	NS
ENDRIN	72-20-8	ug/kg	10	0.35	3.4	100	G	N	100	C	N	--	--	NS	--	--	NS
ENDRIN ALDEHYDE	7421-93-4	ug/kg	9	0.35	2.95	100	G	N	100	C	N	--	--	NS	--	--	NS
ENDRIN KETONE	53494-70-5	ug/kg	9	0.39	3.11	100	G	N	100	C	N	--	--	NS	--	--	NS
GAMMA-BHC (LINDANE)	58-89-9	ug/kg	10	0.22	3.56	100	G	N	100	C	N	--	--	NS	--	--	NS
GAMMA-CHLORDANE	5103-74-2	ug/kg	9	0.35	3.11	100	G	N	100	C	N	--	--	NS	--	--	NS
HEPTACHLOR	76-44-8	ug/kg	9	0.34	3.35	100	G	N	100	C	N	--	--	NS	--	--	NS
HEPTACHLOR EPOXIDE	1024-57-3	ug/kg	8	0.26	4.71	100	G	N	100	C	N	--	--	NS	--	--	NS
METHOXYCHLOR	72-43-5	ug/kg	9	1.4	6.34	100	G	N	100	C	N	--	--	NS	--	--	NS
TOXAPHENE	8001-35-2	ug/kg	10	18	93.2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1016	12674-11-2	ug/kg	10	5.2	15	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1221	11104-28-2	ug/kg	10	10.3	15	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1232	11141-16-5	ug/kg	10	5.4	11.6	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1242	53469-21-9	ug/kg	10	6.16	10	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1248	12672-29-6	ug/kg	10	4.5	9.1	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1254	11097-69-1	ug/kg	5	7.48	9	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
AROCLOR 1260	11096-82-5	ug/kg	8	9.2	14.1	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
SVOCs																	
1,1'-BIPHENYL	92-52-4	ug/kg	17	22	22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,2'-OXYBIS(1-CHLOROPROPANE)	108-60-1	ug/kg	17	30	30	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,5-TRICHLOROPHENOL	95-95-4	ug/kg	17	49	49	4,000	F	N	9,000	B	N	--	--	NS	--	--	NS
2,4,6-TRICHLOROPHENOL	88-06-2	ug/kg	17	50	50	100	G	N	10,000	B	N	--	--	NS	--	--	NS
2,4-DICHLOROPHENOL	120-83-2	ug/kg	17	22	22	100	G	N	100	C	N	--	--	NS	--	--	NS
2,4-DIMETHYLPHENOL	105-67-9	ug/kg	17	30	30	100	G	N	100	C	N	--	--	NS	--	--	NS
2,4-DINITROPHENOL	51-28-5	ug/kg	17	170	170	20,000	F	N	100	C	**Y**	--	--	NS	--	--	NS
2,4-DINITROTOLUENE	121-14-2	mg/kg	15	20	20	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,6-DINITROTOLUENE	606-20-2	mg/kg	17	21	21	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-CHLORONAPHTHALENE	91-58-7	ug/kg	17	22	22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-CHLOROPHENOL	95-57-8	ug/kg	17	18	18	7,000	F	N	10,000	B	N	--	--	NS	--	--	NS
2-METHYLNAPHTHALENE	91-57-6	ug/kg	17	24	24	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-METHYLPHENOL	95-48-7	ug/kg	17	27	27	100	G	N	100	C	N	--	--	NS	--	--	NS
2-NITROANILINE	88-74-4	ug/kg	17	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-NITROPHENOL	88-75-5	ug/kg	17	26	26	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3,3'-DICHLOROBENZIDINE	91-94-1	ug/kg	17	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3-NITROANILINE	99-09-2	ug/kg	17	34	34	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4,6-DINITRO-2-METHYLPHENOL	534-52-1	ug/kg	17	35	35	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-BROMOPHENYL PHENYL ETHER	101-55-3	ug/kg	17	380	6,000	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-CHLORO-3-METHYLPHENOL	59-50-7	ug/kg	17	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-CHLOROANILINE	106-47-8	ug/kg	17	16	16	20,000	F	N	--	--	NS	--	--	NS	--	--	NS
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	ug/kg	17	380	6,000	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-METHYLPHENOL	106-44-5	ug/kg	17	48	48	100	G	N	100	C	N	--	--	NS	--	--	NS

Table F.3-3
Non-detected Chemicals MDL Screening for Area B - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
4-NITROANILINE	100-01-6	ug/kg	17	39	39	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-NITROPHENOL	100-02-7	ug/kg	17	75	75	100	G	N	7,000	B	N	--	--	NS	--	--	NS
ACENAPHTHENE	83-32-9	ug/kg	17	31	31	100	G	N	100	C	N	--	--	NS	--	--	NS
ACENAPHTHYLENE	208-96-8	ug/kg	17	17	17	100	G	N	100	C	N	--	--	NS	--	--	NS
ACETOPHENONE	98-86-2	ug/kg	17	23	23	--	--	NS	--	--	NS	--	--	NS	--	--	NS
ANTHRACENE	120-12-7	ug/kg	17	25	25	100	G	N	100	C	N	--	--	NS	--	--	NS
ATRAZINE	1912-24-9	ug/kg	17	16	16	--	--	NS	--	--	NS	--	--	NS	--	--	NS
BENZALDEHYDE	100-52-7	ug/kg	17	39	39	--	--	NS	--	--	NS	--	--	NS	--	--	NS
BENZO(A)ANTHRACENE	56-55-3	ug/kg	17	29	29	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(A)PYRENE	50-32-8	ug/kg	17	23	23	100	G	N	--	--	NS	--	--	NS	--	--	NS
BENZO(B)FLUORANTHENE	205-99-2	ug/kg	17	36	36	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(G,H,I)PERYLENE	191-24-2	ug/kg	17	23	23	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(K)FLUORANTHENE	207-08-9	ug/kg	17	29	29	100	G	N	100	C	N	--	--	NS	--	--	NS
BIS(2-CHLOROETHOXY)METHANE	111-91-1	ug/kg	17	21	21	--	--	NS	--	--	NS	--	--	NS	--	--	NS
BIS(2-CHLOROETHYL)ETHER	111-44-4	ug/kg	17	18	18	--	--	NS	--	--	NS	--	--	NS	--	--	NS
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	ug/kg	7	32	32	--	--	NS	--	--	NS	--	--	NS	--	--	NS
BUTYL BENZYL PHTHALATE	85-68-7	ug/kg	17	380	6,000	--	--	NS	--	--	NS	--	--	NS	--	--	NS
CAPROLACTAM	105-60-2	ug/kg	17	62	62	--	--	NS	--	--	NS	--	--	NS	--	--	NS
CARBAZOLE	86-74-8	ug/kg	17	29	29	--	--	NS	--	--	NS	--	--	NS	--	--	NS
CHRYSENE	218-01-9	ug/kg	17	28	28	100	G	N	100	C	N	--	--	NS	--	--	NS
DI-N-BUTYL PHTHALATE	84-74-2	ug/kg	11	380	430	200,000	F	N	--	--	NS	--	--	NS	--	--	NS
DI-N-OCTYL PHTHALATE	117-84-0	ug/kg	17	380	6,000	--	--	NS	--	--	NS	--	--	NS	--	--	NS
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/kg	17	21	21	100	G	N	100	C	N	--	--	NS	--	--	NS
DIBENZOFURAN	132-64-9	ug/kg	17	24	24	--	--	NS	--	--	NS	--	--	NS	--	--	NS
DIETHYL PHTHALATE	84-66-2	ug/kg	8	380	430	--	--	NS	--	--	NS	--	--	NS	--	--	NS
DIMETHYL PHTHALATE	131-11-3	ug/kg	15	380	1,600	--	--	NS	--	--	NS	--	--	NS	--	--	NS
FLUORANTHENE	206-44-0	ug/kg	17	18	18	100	G	N	100	C	N	--	--	NS	--	--	NS
FLUORENE	86-73-7	ug/kg	17	18	18	100	G	N	100	C	N	--	--	NS	--	--	NS
HEXACHLOROBENZENE	118-74-1	ug/kg	17	22	22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
HEXACHLOROBUTADIENE	87-68-3	ug/kg	17	24	24	--	--	NS	--	--	NS	--	--	NS	--	--	NS
HEXACHLOROCYCLOPENTADIENE	77-47-4	ug/kg	17	67	67	--	--	NS	--	--	NS	--	--	NS	--	--	NS
HEXACHLOROETHANE	67-72-1	ug/kg	17	17	17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/kg	17	20	20	100	G	N	100	C	N	--	--	NS	--	--	NS
ISOPHORONE	78-59-1	ug/kg	17	28	28	--	--	NS	--	--	NS	--	--	NS	--	--	NS
N-NITROSO-DI-N-PROPYLAMINE	621-64-7	ug/kg	17	21	21	--	--	NS	--	--	NS	--	--	NS	--	--	NS
N-NITROSODIPHENYLAMINE	86-30-6	ug/kg	13	380	430	--	--	NS	--	--	NS	--	--	NS	--	--	NS
NAPHTHALENE	91-20-3	ug/kg	17	21	21	100	G	N	100	C	N	--	--	NS	--	--	NS
NITROBENZENE	98-95-3	mg/kg	17	28	28	--	--	NS	--	--	NS	--	--	NS	--	--	NS
PENTACHLOROPHENOL	87-86-5	ug/kg	17	46	46	5,000	A	N	31,000	A	N	2,100	A	N	2,800	A	N
PHENOL	108-95-2	ug/kg	17	34	34	100	G	N	30,000	B	N	--	--	NS	--	--	NS
PYRENE	129-00-0	ug/kg	17	24	24	100	G	N	100	C	N	--	--	NS	--	--	NS
Dioxin/Furans																	
1,2,3,4,6,7,8,9-OCDF (OCDF)	39001-02-0	pg/g	3	0.92	11.9	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,4,6,7,8-HpCDF	67562-39-4	pg/g	1	5.96	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,4,7,8,9-HpCDF	55673-89-7	pg/g	11	0.397	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,4,7,8-HxCDD	39227-28-6	pg/g	7	0.412	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,4,7,8-HxCDF	70648-26-9	pg/g	7	0.397	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,6,7,8-HxCDD	57653-85-7	pg/g	5	0.412	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,6,7,8-HxCDF	57117-44-9	pg/g	5	0.397	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8,9-HxCDD	19408-74-3	pg/g	6	0.412	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8,9-HxCDF	72918-21-9	pg/g	12	0.2	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8-PeCDD	40321-76-4	pg/g	14	0.397	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3,7,8-PeCDF	57117-41-6	pg/g	6	0.3	5.39	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,4,6,7,8-HxCDF	60851-34-5	pg/g	5	0.397	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,4,7,8-PeCDF	57117-31-4	pg/g	1	0.397	0.397	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,7,8-TCDD	1746-01-6	pg/g	6	0.0795	1.19	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,7,8-TCDF	51207-31-9	pg/g	1	0.217	0.217	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total HpCDFs	--	pg/g	2	0.522	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total HxCDDs	--	pg/g	3	0.545	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Table F.3-3
Non-detected Chemicals MDL Screening for Area B - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
Total PeCDDs	--	pg/g	3	0.397	5.96	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total PeCDFs	--	pg/g	1	0.397	0.397	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Total TCDDs	41903-57-5	pg/g	5	0.0795	1.19	--	--	NS	--	--	NS	--	--	NS	--	--	NS
PAHs																	
ACENAPHTHENE	83-32-9	ug/kg	12	5.8	5.9	100	G	N	100	C	N	--	--	NS	--	--	NS
ACENAPHTHYLENE	208-96-8	ug/kg	16	5.9	5.9	100	G	N	100	C	N	--	--	NS	--	--	NS
ANTHRACENE	120-12-7	ug/kg	17	5.4	5.4	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(A)ANTHRACENE	56-55-3	ug/kg	14	2.2	2.2	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(A)PYRENE	50-32-8	ug/kg	14	1.6	1.6	100	G	N	--	--	NS	--	--	NS	--	--	NS
BENZO(B)FLUORANTHENE	205-99-2	ug/kg	10	1.7	1.7	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(G,H,I)PERYLENE	191-24-2	ug/kg	15	3.6	3.6	100	G	N	100	C	N	--	--	NS	--	--	NS
BENZO(K)FLUORANTHENE	207-08-9	ug/kg	14	1.4	1.4	100	G	N	100	C	N	--	--	NS	--	--	NS
CHRYSENE	218-01-9	ug/kg	14	2.4	2.4	100	G	N	100	C	N	--	--	NS	--	--	NS
DIBENZO(A,H)ANTHRACENE	53-70-3	ug/kg	16	4.2	4.2	100	G	N	100	C	N	--	--	NS	--	--	NS
FLUORANTHENE	206-44-0	ug/kg	9	2.1	2.1	100	G	N	100	C	N	--	--	NS	--	--	NS
FLUORENE	86-73-7	ug/kg	17	14	14	100	G	N	100	C	N	--	--	NS	--	--	NS
INDENO(1,2,3-CD)PYRENE	193-39-5	ug/kg	16	2.5	2.5	100	G	N	100	C	N	--	--	NS	--	--	NS
NAPHTHALENE	91-20-3	ug/kg	11	14	14	100	G	N	100	C	N	--	--	NS	--	--	NS
PHENANTHRENE	85-01-8	ug/kg	15	8.5	8.5	100	G	N	100	C	N	--	--	NS	--	--	NS
PYRENE	129-00-0	ug/kg	9	4.3	4.3	100	G	N	100	C	N	--	--	NS	--	--	NS
PCB Congeners																	
169-HxCB	32774-16-6	pg/g	1	8.13	8.13	--	--	NS	--	--	NS	--	--	NS	--	--	NS
81-TeCB	70362-50-4	pg/g	1	8.13	8.13	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Explosives																	
1,3,5-TRINITROBENZENE	99-35-4	mg/kg	16	0.079	0.079	8.6	I	N	18.1	I	N	--	--	NS	--	--	NS
1,3-DINITROBENZENE	99-65-0	mg/kg	17	0.097	0.097	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,6-TRINITROTOLUENE	118-96-7	mg/kg	14	0.16	0.16	2.4	H	N	1.2	H	N	--	--	NS	--	--	NS
2,4-DINITROTOLUENE	121-14-2	mg/kg	15	0.12	0.12	5.3	I	N	19.8	I	N	--	--	NS	--	--	NS
2,6-DINITROTOLUENE	606-20-2	mg/kg	17	0.19	0.19	4.5	I	N	6.9	I	N	--	--	NS	--	--	NS
2-AMINO-4,6-DINITROTOLUENE	35572-78-2	mg/kg	16	0.1	0.1	80	J	N	--	--	NS	--	--	NS	--	--	NS
2-NITROTOLUENE	88-72-2	mg/kg	17	0.16	0.16	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3-NITROTOLUENE	99-08-1	mg/kg	17	0.11	0.11	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	mg/kg	16	0.095	0.095	80	J	N	--	--	NS	--	--	NS	--	--	NS
4-NITROTOLUENE	99-99-0	mg/kg	17	0.27	0.27	--	--	NS	--	--	NS	--	--	NS	--	--	NS
HMX (OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TET)	2691-41-0	mg/kg	17	0.1	0.1	--	--	NS	6.3	I	N	--	--	NS	--	--	NS
NITROBENZENE	98-95-3	mg/kg	17	0.17	0.17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE)	121-82-4	mg/kg	16	0.28	0.28	100	K	N	98.6	I	N	--	--	NS	--	--	NS
TETRYL (METHYL-2,4,6-TRINITROPHENYLNITRAMINE)	479-45-8	mg/kg	17	0.4	0.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Nitroglycerin																	
NITROGLYCERIN	55-63-0	mg/kg	15	0.1	1	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
MDL = Method Detection Limit
SL = Screening Level
Eco SSL = Ecological Soil Screening Level

Sources:
A = USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
B = ORNL - Earthworms - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
C = BTAG - Fauna - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
E = ORNL - Microbial Processes - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
F = ORNL - Plants - Toxilogical Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision Efroymson et al.)
G = BTAG - Flora - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
H = Best, E.P.H., H.E. Tatem, K.N. Geter, M.L. Wells and B.K. Lane. 2004. Toxicity and Metabolites of 2,4,6 Trinitrotoluene (TNT) in Plants and Worms from Exposure to Aged Soil.
I = Kuperman. R. 2003. Development of Ecological Toxicity and Biomagnification Data for Explosives Contaminants in Soil.
J = Pennington, Judith C. 1988. Plant Uptake of 2,4,6-Trinitrotoluene, 4-Amino-2,6-Dinitrotoluene, and 2-Amino-4,6-Dinitrotoluene Using 14C-Labeled and Unlabeled Compounds.
K = Simini, M., R.S. Wentsel, R.T. Checkai, C.T. Phillips, N.A. Chester, M.A. Major, and J.C. Amos. 1995. Evaluation of Soil Toxicity at Joliet Army Ammunition Plant.

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available

Table F.3-4
EPC Summary for COPECs - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Surface Soil	Aluminum	mg/kg	14,351	15,708	22,600	15,708	mg/kg	95% Student's t UCL	ProUCL 4.0
	Arsenic	mg/kg	1.565	2.076	5.1	2.076	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Cadmium	mg/kg	0.347	0.181	0.64	0.181	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Calcium	mg/kg	2,338	5,942	14,900	5,942	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	Chromium	mg/kg	22.34	24.97	41.6	24.97	mg/kg	95% Student's t UCL	ProUCL 4.0
	Copper	mg/kg	30.4	58.8	195	58.8	mg/kg	95% Chebyshev (MVUE) UCL	ProUCL 4.0
	Iron	mg/kg	21,018	23,141	35,100	23,141	mg/kg	95% Student's t UCL	ProUCL 4.0
	Lead	mg/kg	356.8	2,581	3,610	2,581	mg/kg	99% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	Manganese	mg/kg	536.2	608.3	883.5	608.3	mg/kg	95% Student's t UCL	ProUCL 4.0
	Mercury	mg/kg	0.143	0.291	0.77	0.291	mg/kg	95% Chebyshev (MVUE) UCL	ProUCL 4.0
	Selenium	mg/kg	1.32	1.53	2.6	1.53	mg/kg	95% UCL (Student's t)	ProUCL 4.0
	Vanadium	mg/kg	35.43	39.57	58.9	39.57	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	Zinc	mg/kg	126.8	272.3	555	272.3	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	4,4'-DDE	mg/kg	0.0338	0.06	0.06	0.06	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	Dieldrin	mg/kg	0.00248	0.00432	0.011	0.00432	mg/kg	95% UCL (Bounding)	FOD < 5%
	Heptachlor Epoxide	mg/kg	0.0135	0.0111	0.021	0.0111	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Aroclor 1254	mg/kg	0.621	0.856	2.8	0.856	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Aroclor 1260	mg/kg	0.202	0.358	0.38	0.358	mg/kg	97.5% KM (Chebyshev) UCL	ProUCL 4.0
	Acenaphthene	mg/kg	1.806	1.091	3.5	1.091	mg/kg	95% KM (t) UCL	ProUCL 4.0
	Acenaphthylene	mg/kg	0.0182	0.0424	0.24	0.0424	mg/kg	95% UCL (Bounding)	FOD < 5%
	Naphthalene	mg/kg	0.596	1.47	8.6	1.47	mg/kg	95% UCL (Bounding)	FOD < 5%
	1,3,5-Trinitrobenzene	mg/kg	1.9	--	1.9	1.9	mg/kg	Maximum Detected Concentration	--
	2,4,6-Trinitrotoluene	mg/kg	46.48	20.26	80	20.26	mg/kg	95% KM (t) UCL	ProUCL 4.0
	2,4-Dinitrotoluene	mg/kg	5.69	9.533	11	9.533	mg/kg	99% KM (Chebyshev) UCL	ProUCL 4.0
	2-Amino-4,6-Dinitrotoluene	mg/kg	9.6	1.61	9.6	1.61	mg/kg	95% UCL (Bounding)	FOD < 5%
	4-Amino-2,6-Dinitrotoluene	mg/kg	14	2.32	14	2.32	mg/kg	95% UCL (Bounding)	FOD < 5%
	RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	mg/kg	0.69	1.51	8.2	1.51	mg/kg	95% UCL (Bounding)	FOD < 5%
	Nitroglycerin	mg/kg	29.6	400	400	400	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	2,3,7,8-TCDD TEQ Mammalian	mg/kg	2.61E-05	1.92E-04	1.83E-04	1.83E-04	mg/kg	99% Chebyshev (MVUE) UCL	ProUCL 4.0
	2,3,7,8-TCDD TEQ Avian	mg/kg	3.97E-05	2.68E-04	3.22E-04	2.68E-04	mg/kg	99% Chebyshev (MVUE) UCL	ProUCL 4.0

Notes:
FOD = frequency of detection
For FOD of 100% to 5%, ProUCL 4.0 was used.
For FOD of <5%, bounding was used.
UCL = Upper Confidence Limit
mg/kg = Milligram Per Kilogram

Table F.3-5
Plant Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TAL Metals			
Aluminum	7429-90-5	50	ORNL-Plants
Antimony	7440-36-0	5	ORNL-Plants
Arsenic	7440-38-2	18	ECO SSL
Barium	7440-39-3	500	ORNL-Plants
Beryllium	7440-41-7	10	ORNL-Plants
Cadmium	7440-43-9	32	ECO SSL
Calcium	7440-70-2	4	ORNL-Plants
Chromium	7440-47-3	1	ORNL-Plants
Cobalt	7440-48-4	13	ECO SSL
Copper	7440-50-8	70	ECO SSL
Iron	7439-89-6	NV	--
Lead	7439-92-1	120	ECO SSL
Magnesium	7439-95-4	NV	--
Manganese	7439-96-5	500	ORNL-Plants
Mercury	7439-97-6	0.3	ORNL-Plants
Nickel	7440-02-0	38	ECO SSL
Potassium	7440-09-7	NV	--
Selenium	7782-49-2	1	ORNL-Plants
Silver	7440-22-4	560	ECO SSL
Sodium	7440-23-5	NV	--
Vanadium	7440-62-2	2	ORNL-Plants
Zinc	7440-66-6	50	ORNL-Plants
TCL Pesticides/PCBs			
4,4'-DDE	72-55-9	0.1	BTAG - Flora
alpha-Chlordane [1]	5103-71-9	0.1	BTAG - Flora
delta-BHC	319-86-8	100	BTAG - Flora
Dieldrin	60-57-1	0.1	BTAG - Flora
Endrin Aldehyde	7421-93-4	0.1	BTAG - Flora
Endrin Ketone	53494-70-5	0.1	BTAG - Flora
gamma-Chlordane [1]	5103-74-2	0.1	BTAG - Flora
Heptachlor	76-44-8	0.1	BTAG - Flora
Heptachlor Epoxide	1024-57-3	0.1	BTAG - Flora
Methoxychlor	72-43-5	0.1	BTAG - Flora
Aroclor 1254	11097-69-1	NV	--
Aroclor 1260	11096-82-5	NV	--
TCL SVOCs			
Bis(2-ethylhexyl)phthalate	117-81-7	NV	--
Di-n-butylphthalate	84-74-2	200	ORNL-Plants
Diethylphthalate	84-66-2	NV	--
Dimethylphthalate	131-11-3	NV	--
N-Nitrosodiphenylamine	86-30-6	NV	--
PAHs			
Acenaphthene	83-32-9	0.1	BTAG - Flora
Acenaphthylene	208-96-8	0.1	BTAG - Flora
Benzo(a)anthracene	56-55-3	0.1	BTAG - Flora
Benzo(a)pyrene	50-32-8	0.1	BTAG - Flora
Benzo(b)fluoranthene	205-99-2	0.1	BTAG - Flora
Benzo(g,h,i)perylene	191-24-2	0.1	BTAG - Flora
Benzo(k)fluoranthene	207-08-9	0.1	BTAG - Flora

Table F.3-5
Plant Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
Chrysene	218-01-9	0.1	BTAG - Flora
Dibenz(a,h)anthracene	53-70-3	0.1	BTAG - Flora
Fluoranthene	206-44-0	0.1	BTAG - Flora
Indeno(1,2,3-cd)pyrene	193-39-5	0.1	BTAG - Flora
Naphthalene	91-20-3	0.1	BTAG - Flora
Phenanthrene	85-01-8	0.1	BTAG - Flora
Pyrene	129-00-0	0.1	BTAG - Flora
Explosives			
1,3,5-Trinitrobenzene	99-35-4	8.6	Kuperman 2003
2,4,6-Trinitrotoluene	118-96-7	2.4	Best et al. 2004
2,4-Dinitrotoluene	121-14-2	5.3	Kuperman 2003
2-Amino-4,6-Dinitrotoluene	355-72-78-2	80	Pennington 1988
4-Amino-2,6-Dinitrotoluene	1946-51-0	80	Pennington 1988
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	100	Simini et al. 1995
Nitroglycerin			
Nitroglycerin	55-63-0	NV	--

Notes:

CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
ORNL - Plants - Toxilogical Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision Efroymson et al.)
BTAG - Flora - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
[1] = Chlordane BTAG Screening Level Used
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
NV = No Value Available

Best, E.P.H., H.E. Tatem, K.N. Geter, M.L. Wells and B.K. Lane. 2004. Toxicity and Metabolites of 2,4,6 Trinitrotoluene (TNT) in Plants and Worms from Exposure to Aged Soil. U.S. Army Corps of Engineers, Engineer Research and Development Center. ERDC/EL TR-04-18.

Kuperman. R. 2003. Development of Ecological Toxicity and Biomagnification Data for Explosives Contaminants in Soil. U.S. Army Edgewood Chemical Biological Center. Final Techinical Report. Project CU-1221.

Pennington, Judith C. 1988. Plant Uptake of 2,4,6-Trinitrotoluene, 4-Amino-2,6-Dinitrotoluene, and 2-Amino-4,6-Dinitrotoluene Using 14C-Labeled and Unlabeled Compounds. ADA203690.

Simini, M., R.S. Wentsel, R.T. Checkai, C.T. Phillips, N.A. Chester, M.A. Major, and J.C. Amos. 1995. Evaluation of Soil Toxicity at Joliet Army Ammunition Plant. Environ. Toxicol. Chem. 14:623-630.

Table F.3-6
Plant Screening - Soil
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Inorganics						
Aluminum	7429-90-5	22,600	50	**4.5E+02**	15,708	**3.1E+02**
Antimony	7440-36-0	1.9	5	3.8E-01	NC	NC
Arsenic	7440-38-2	5.1	18	2.8E-01	NC	NC
Barium	7440-39-3	241	500	4.8E-01	NC	NC
Beryllium	7440-41-7	1.1	10	1.1E-01	NC	NC
Cadmium	7440-43-9	0.64	32	2.0E-02	NC	NC
Calcium	7440-70-2	14,900	4	**3.7E+03**	5,942	**1.5E+03**
Chromium	7440-47-3	41.6	1	**4.2E+01**	25	**2.5E+01**
Cobalt	7440-48-4	12.2	13	9.4E-01	NC	NC
Copper	7440-50-8	195	70	**2.8E+00**	58.8	8.4E-01
Iron	7439-89-6	35,100	NV	NC	NC	NC
Lead	7439-92-1	3,610	120	**3.0E+01**	2,581	**2.2E+01**
Magnesium	7439-95-4	9,040	NV	NC	NC	NC
Manganese	7439-96-5	883.5	500	**1.8E+00**	608	**1.2E+00**
Mercury	7439-97-6	0.77	0.3	**2.6E+00**	0.291	9.7E-01
Nickel	7440-02-0	19.3	38	5.1E-01	NC	NC
Potassium	7440-09-7	2,880	NV	NC	NC	NC
Selenium	7782-49-2	2.6	1	**2.6E+00**	1.53	**1.5E+00**
Silver	7440-22-4	0.11	560	2.0E-04	NC	NC
Sodium	7440-23-5	1,270	NV	NC	NC	NC
Vanadium	7440-62-2	58.9	2	**2.9E+01**	39.6	**2.0E+01**
Zinc	7440-66-6	555	50	**1.1E+01**	272.3	**5.4E+00**
TCL Pesticides/PCBs						
4,4'-DDE	72-55-9	0.06	0.1	6.0E-01	NC	NC
alpha-Chlordane	5103-71-9	0.062	0.1	6.2E-01	NC	NC
delta-BHC	319-86-8	0.006	100	6.0E-05	NC	NC
Dieldrin	60-57-1	0.011	0.1	1.1E-01	NC	NC
Endrin Aldehyde	7421-93-4	0.0044	0.1	4.4E-02	NC	NC
Endrin Ketone	53494-70-5	0.0075	0.1	7.5E-02	NC	NC
gamma-Chlordane	5103-74-2	0.055	0.1	5.5E-01	NC	NC
Heptachlor	76-44-8	0.0013	0.1	1.3E-02	NC	NC
Heptachlor Epoxide	1024-57-3	0.021	0.1	2.1E-01	NC	NC
Methoxychlor	72-43-5	0.003	0.1	3.0E-02	NC	NC
Aroclor 1254	11097-69-1	2.8	NV	NC	NC	NC
Aroclor 1260	11096-82-5	0.38	NV	NC	NC	NC
TCL SVOCs						
Bis(2-ethylhexyl)phthalate	117-81-7	1.4	NV	NC	NC	NC
Di-n-butylphthalate	84-74-2	11	200	5.5E-02	NC	NC
Diethylphthalate	84-66-2	96	NV	NC	NC	NC
Dimethylphthalate	131-11-3	1.9	NV	NC	NC	NC
N-Nitrosodiphenylamine	86-30-6	1.8	NV	NC	NC	NC
PAHs						
Acenaphthene	83-32-9	3.5	0.1	**3.5E+01**	1.09	**1.1E+01**
Acenaphthylene	208-96-8	0.24	0.1	**2.4E+00**	0.0424	4.2E-01
Benzo(a)anthracene	56-55-3	0.015	0.1	1.5E-01	NC	NC
Benzo(a)pyrene	50-32-8	0.057	0.1	5.7E-01	NC	NC
Benzo(b)fluoranthene	205-99-2	0.1	0.1	1.0E+00	NC	NC
Benzo(g,h,i)perylene	191-24-2	0.084	0.1	8.4E-01	NC	NC
Benzo(k)fluoranthene	207-08-9	0.032	0.1	3.2E-01	NC	NC
Chrysene	218-01-9	0.042	0.1	4.2E-01	NC	NC
Dibenz(a,h)anthracene	53-70-3	0.0089	0.1	8.9E-02	NC	NC
Fluoranthene	206-44-0	0.072	0.1	7.2E-01	NC	NC
Indeno(1,2,3-cd)pyrene	193-39-5	0.035	0.1	3.5E-01	NC	NC
Naphthalene	91-20-3	8.6	0.1	**8.6E+01**	1.47	**1.5E+01**

Table F.3-6
Plant Screening - Soil
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Phenanthrene	85-01-8	0.025	0.1	2.5E-01	NC	NC
Pyrene	129-00-0	0.065	0.1	6.5E-01	NC	NC
Explosives						
1,3,5-Trinitrobenzene	99-35-4	1.9	8.6	2.2E-01	NC	NC
2,4,6-Trinitrotoluene	118-96-7	80	2.4	**3.3E+01**	20.26	**8.4E+00**
2,4-Dinitrotoluene	121-14-2	11	5.3	**2.1E+00**	9.533	**1.8E+00**
2-Amino-4,6-Dinitrotoluene	355-72-78-2	9.6	80	1.2E-01	NC	NC
4-Amino-2,6-Dinitrotoluene	1946-51-0	14	80	1.8E-01	NC	NC
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	8.2	100	8.2E-02	NC	NC
Nitroglycerin						
Nitroglycerin	55-63-0	400	NV	NC	NC	NC

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
NV = No Value Available
NC = Not Calculated
Hazard Quotient = Soil Concentration/Screening Level
EPC = Exposure Point Concentration

Table F.3-7
Invertebrate and Microbial Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TAL Metals			
Aluminum	7429-90-5	NV	--
Antimony	7440-36-0	78	ECO SSL
Arsenic	7440-38-2	60	ORNL-Earthworm
Barium	7440-39-3	330	ECO SSL
Beryllium	7440-41-7	40	ECO SSL
Cadmium	7440-43-9	140	ECO SSL
Calcium	7440-70-2	NV	--
Chromium	7440-47-3	0.4	ORNL-Earthworm
Cobalt	7440-48-4	200	BTAG - Fauna
Copper	7440-50-8	80	ECO SSL
Iron	7439-89-6	200	ORNL - Microbial
Lead	7439-92-1	1,700	ECO SSL
Magnesium	7439-95-4	NV	--
Manganese	7439-96-5	100	ORNL - Microbial
Mercury	7439-97-6	0.1	ORNL-Earthworm
Nickel	7440-02-0	280	ECO SSL
Potassium	7440-09-7	NV	--
Selenium	7782-49-2	70	ORNL-Earthworm
Silver	7440-22-4	50	ORNL - Microbial
Sodium	7440-23-5	NV	--
Vanadium	7440-62-2	20	ORNL - Microbial
Zinc	7440-66-6	100	ORNL-Earthworm
TCL Pesticides/PCBs			
4,4'-DDE	72-55-9	0.1	BTAG - Fauna
alpha-Chlordane [1]	5103-71-9	0.1	BTAG - Fauna
delta-BHC	319-86-8	NV	--
Dieldrin	60-57-1	0.1	BTAG - Fauna
Endrin Aldehyde	7421-93-4	0.1	BTAG - Fauna
Endrin Ketone	53494-70-5	0.1	BTAG - Fauna
gamma-Chlordane [1]	5103-74-2	0.1	BTAG - Fauna
Heptachlor	76-44-8	0.1	BTAG - Fauna
Heptachlor Epoxide	1024-57-3	0.1	BTAG - Fauna
Methoxychlor	72-43-5	0.1	BTAG - Fauna
Aroclor 1254	11097-69-1	NV	--
Aroclor 1260	11096-82-5	NV	--
TCL SVOCs			
Bis(2-ethylhexyl)phthalate	117-81-7	NV	--
Di-n-butylphthalate	84-74-2	NV	--
Diethylphthalate	84-66-2	NV	--
Dimethylphthalate	131-11-3	NV	--
N-Nitrosodiphenylamine	86-30-6	NV	--
PAHs			
Acenaphthene	83-32-9	0.1	BTAG - Fauna
Acenaphthylene	208-96-8	0.1	BTAG - Fauna
Benzo(a)anthracene	56-55-3	0.1	BTAG - Fauna
Benzo(a)pyrene	50-32-8	NV	--
Benzo(b)fluoranthene	205-99-2	0.1	BTAG - Fauna

Table F.3-7
Invertebrate and Microbial Screening Level Sources - Soil
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
Benzo(g,h,i)perylene	191-24-2	0.1	BTAG - Fauna
Benzo(k)fluoranthene	207-08-9	0.1	BTAG - Fauna
Chrysene	218-01-9	0.1	BTAG - Fauna
Dibenz(a,h)anthracene	53-70-3	0.1	BTAG - Fauna
Fluoranthene	206-44-0	0.1	BTAG - Fauna
Indeno(1,2,3-cd)pyrene	193-39-5	0.1	BTAG - Fauna
Naphthalene	91-20-3	0.1	BTAG - Fauna
Phenanthrene	85-01-8	0.1	BTAG - Fauna
Pyrene	129-00-0	0.1	BTAG - Fauna
Explosives			
1,3,5-Trinitrobenzene	99-35-4	18.1	Kuperman 2003
2,4,6-Trinitrotoluene	118-96-7	1.2	Best et al. 2004
2,4-Dinitrotoluene	121-14-2	19.8	Kuperman 2003
2-Amino-4,6-Dinitrotoluene	355-72-78-2	NV	--
4-Amino-2,6-Dinitrotoluene	1946-51-0	NV	--
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	98.6	Kuperman 2003
Nitroglycerin			
Nitroglycerin	55-63-0	NV	--

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
ORNL - Earthworms - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
ORNL - Microbial Processes - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
BTAG - Fauna - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
[1] = Chlordane BTAG Screening Level Used
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
NV = No Value Available
Best, E.P.H., H.E. Tatem, K.N. Geter, M.L. Wells and B.K. Lane. 2004. Toxicity and Metabolites of 2,4,6 Trinitrotoluene (TNT) in Plants and Worms from Exposure to Aged Soil. U.S. Army Corps of Engineers, Engineer Research and Development Center. ERDC/EL TR-04-18.
Kuperman. R. 2003. Development of Ecological Toxicity and Biomagnification Data for Explosives Contaminants in Soil. U.S. Army Edgewood Chemical Biological Center. Final Techinical Report. Project CU-1221.

Table F.3-8
Invertebrate and Microbial Screening - Soil
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Inorganics						
Aluminum	7429-90-5	22,600	NV	NC	NC	NC
Antimony	7440-36-0	1.9	78	2.4E-02	NC	NC
Arsenic	7440-38-2	5.1	60	8.5E-02	NC	NC
Barium	7440-39-3	241	330	7.3E-01	NC	NC
Beryllium	7440-41-7	1.1	40	2.8E-02	NC	NC
Cadmium	7440-43-9	0.64	140	4.6E-03	NC	NC
Calcium	7440-70-2	14,900	NV	NC	NC	NC
Chromium	7440-47-3	41.6	0.4	**1.0E+02**	25	**6.3E+01**
Cobalt	7440-48-4	12.2	200	6.1E-02	NC	NC
Copper	7440-50-8	195	80	**2.4E+00**	58.8	7.4E-01
Iron	7439-89-6	35,100	200	**1.8E+02**	23,141	**1.2E+02**
Lead	7439-92-1	3,610	1,700	**2.1E+00**	2,581	**1.5E+00**
Magnesium	7439-95-4	9,040	NV	NC	NC	NC
Manganese	7439-96-5	883.5	100	**8.8E+00**	608	**6.1E+00**
Mercury	7439-97-6	0.77	0.1	**7.7E+00**	0.291	**2.9E+00**
Nickel	7440-02-0	19.3	280	6.9E-02	NC	NC
Potassium	7440-09-7	2,880	NV	NC	NC	NC
Selenium	7782-49-2	2.6	70	3.7E-02	NC	NC
Silver	7440-22-4	0.11	50	2.2E-03	NC	NC
Sodium	7440-23-5	1,270	NV	NC	NC	NC
Vanadium	7440-62-2	58.9	20	**2.9E+00**	39.6	**2.0E+00**
Zinc	7440-66-6	555	100	**5.6E+00**	272.3	**2.7E+00**
TCL Pesticides/PCBs						
4,4'-DDE	72-55-9	0.06	0.1	6.0E-01	NC	NC
alpha-Chlordane	5103-71-9	0.062	0.1	6.2E-01	NC	NC
delta-BHC	319-86-8	0.006	NV	NC	NC	NC
Dieldrin	60-57-1	0.011	0.1	1.1E-01	NC	NC
Endrin Aldehyde	7421-93-4	0.0044	0.1	4.4E-02	NC	NC
Endrin Ketone	53494-70-5	0.0075	0.1	7.5E-02	NC	NC
gamma-Chlordane	5103-74-2	0.055	0.1	5.5E-01	NC	NC
Heptachlor	76-44-8	0.0013	0.1	1.3E-02	NC	NC
Heptachlor Epoxide	1024-57-3	0.021	0.1	2.1E-01	NC	NC
Methoxychlor	72-43-5	0.003	0.1	3.0E-02	NC	NC
Aroclor 1254	11097-69-1	2.8	NV	NC	NC	NC
Aroclor 1260	11096-82-5	0.38	NV	NC	NC	NC
TCL SVOCs						
Bis(2-ethylhexyl)phthalate	117-81-7	1.4	NV	NC	NC	NC
Di-n-butylphthalate	84-74-2	11	NV	NC	NC	NC
Diethylphthalate	84-66-2	96	NV	NC	NC	NC
Dimethylphthalate	131-11-3	1.9	NV	NC	NC	NC
N-Nitrosodiphenylamine	86-30-6	1.8	NV	NC	NC	NC
PAHs						
Acenaphthene	83-32-9	3.5	0.1	**3.5E+01**	1.09	**1.1E+01**
Acenaphthylene	208-96-8	0.24	0.1	**2.4E+00**	0.0424	4.2E-01
Benzo(a)anthracene	56-55-3	0.015	0.1	1.5E-01	NC	NC
Benzo(a)pyrene	50-32-8	0.057	NV	NC	NC	NC
Benzo(b)fluoranthene	205-99-2	0.1	0.1	1.0E+00	NC	NC
Benzo(g,h,i)perylene	191-24-2	0.084	0.1	8.4E-01	NC	NC
Benzo(k)fluoranthene	207-08-9	0.032	0.1	3.2E-01	NC	NC
Chrysene	218-01-9	0.042	0.1	4.2E-01	NC	NC
Dibenz(a,h)anthracene	53-70-3	0.0089	0.1	8.9E-02	NC	NC
Fluoranthene	206-44-0	0.072	0.1	7.2E-01	NC	NC
Indeno(1,2,3-cd)pyrene	193-39-5	0.035	0.1	3.5E-01	NC	NC
Naphthalene	91-20-3	8.6	0.1	**8.6E+01**	1.47	**1.5E+01**
Phenanthrene	85-01-8	0.025	0.1	2.5E-01	NC	NC

Table F.3-8
Invertebrate and Microbial Screening - Soil
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Pyrene	129-00-0	0.065	0.1	6.5E-01	NC	NC
Explosives						
1,3,5-Trinitrobenzene	99-35-4	1.9	18.1	1.0E-01	NC	NC
2,4,6-Trinitrotoluene	118-96-7	80	1.2	**6.7E+01**	20.26	**1.7E+01**
2,4-Dinitrotoluene	121-14-2	11	19.8	5.6E-01	NC	NC
2-Amino-4,6-Dinitrotoluene	355-72-78-2	9.6	NV	NC	NC	NC
4-Amino-2,6-Dinitrotoluene	1946-51-0	14	NV	NC	NC	NC
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	8.2	98.6	8.3E-02	NC	NC
Nitroglycerin						
Nitroglycerin	55-63-0	400	NV	NC	NC	NC

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
NV = No Value Available
NC = Not Calculated
Hazard Quotient = Soil Concentration/Screening Level
EPC = Exposure Point Concentration

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Table F.3-9
Wildlife Profiles
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Representative Species			Composition of Diet [1] (%)				Preliminary Assessment					Refined Assessment					
							Minimum Body Weight [1]	Maximum Body Weight [1]	Maximum Food Ingestion Rate [2]	Maximum Substrate Ingestion Rate [3]		Average Body Weight [1]	Average Food Ingestion Rate [2]	Average Substrate Ingestion Rate [3]	Home Range (ha)	Proportion of Year Species Active	AUFs
Food-web Classification	Common Name	Scientific Name	Plants (incl. fungi)	Inverte-brates	Small mammals	Fish	kg	kg	kg dw/day	% of dry intake	kg dry wt./day	kg	kg dw/day	kg dry wt./day			Study Area (0.67) hectares
Birds																	
soil-probing invertivore	American robin	*Turdus migratorius*	62%	38%			0.0635	0.103	0.020	5%	0.001	0.077	0.016	0.0008	0.48	1	1.00
large carnivore	Red-tailed hawk	*Buteo jamaicensis*			100%		0.957	1.235	0.063	0%	0	1.134	0.059	0	250	1	0.0027
Mammals																	
small herbivore	Meadow vole	*Microtus pennsylvanicus*	100%				0.017	0.0524	0.010	2.4%	0.00024	0.037	0.008	0.00019	0.037	1	1
medium carnivore	Red fox	*Vulpes vulpes*	17%	4%	79%		2.95	7.04	0.342	2.8%	0.0096	4.53	0.238	0.0067	96	1	0.0070
small invertivore	Short-tailed shrew	*Blarina brevicauda*	14%	86%			0.0125	0.0225	0.003	13%	0.00039	0.015	0.002	0.00026	0.39	1	1.00

Notes:
kg = Kilogram
kg dw/day = Kilogram Dry-weight per Day
L/day = Liter per Day

[1]Wildlife Exposure Factors Handbook. U.S. Environmental Protection Agency (EPA). 1993. Office of Research and Development. 2 Volumes. EPA/600/R93/187a&b. December.
[2] Estimated food intake rate (kg [dw]/day) calculated as follows:
FI ((kg/day) = 0.0687 $Wt.^{0.882}$ for mammals (red fox and short-tailed shrew)
FI ((g/day) = 0.577 $Wt.^{0.727}$ for herbivores (meadow vole)
FI ((g/day) = 0.301 $Wt.^{0.751}$ for non-passerine birds (red-tailed hawk)
FI ((g/day) = 0.398 $Wt.^{0.850}$ for passerine birds (american robin)
[3]Estimating Exposure to Terrestrial Wildlife to Contaminants. Sample and Sutter. 1994. ES/ER/TM-125.
The soil ingestion rate for the american robin set equal to 38% of the american woodcock value (0.34*10.4%=4%), based on a robin diet of 38% invertbrates.

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Table F.3-10
Wildlife TRVs and Sources
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

	CAS #	AVIAN TEST SPECIES				MAMMALIAN TEST SPECIES					AVIAN RECEPTORS				MAMMALIAN RECEPTORS					
											American Robin		Red-tailed Hawk		Meadow Vole		Red Fox		Short-tailed Shrew	
		Chronic LOAEL	Chronic NOAEL	Test Animal	Source	Chronic LOAEL	Chronic NOAEL	Test Animal	Test Animal Body Weight (kg)	Source	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL
		(mg/kg-bw/d)				(mg/kg-bw/d)					(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)	
Arsenic	7440-38-2	1.28E+01	5.14E+00	mallard duck	ORNL 1996	1.26	0.126	mouse	0.03	ORNL 1996	1.28E+01	5.14E+00	1.28E+01	5.14E+00	1.20E+00	1.20E-01	3.59E-01	3.59E-02	1.50E+00	1.50E-01
Cadmium	7440-43-9	2.00E+01	1.45E+00	mallard duck	ORNL 1996	10	1	rat	0.3	ORNL 1996	2.00E+01	1.45E+00	2.00E+01	1.45E+00	1.69E+01	1.69E+00	5.07E+00	5.07E-01	2.11E+01	2.11E+00
Chromium	7440-47-3	5.00E+00	1.00E+00	black duck	ORNL 1996	32.8	3.28	rat	0.35	ORNL 1996	5.00E+00	1.00E+00	5.00E+00	1.00E+00	5.75E+01	5.75E+00	1.73E+01	1.73E+00	7.21E+01	7.21E+00
Copper	7440-50-8	6.17E+01	4.70E+01	1 day old chicks	ORNL 1996	15.4	11.7	mink	1	ORNL 1996	6.17E+01	4.70E+01	6.17E+01	4.70E+01	3.51E+01	2.67E+01	1.06E+01	8.02E+00	4.40E+01	3.34E+01
Lead	7439-92-1	1.13E+01	1.13E+00	Japanese quail	ORNL 1996	80	8	rat	0.35	ORNL 1996	1.13E+01	1.13E+00	1.13E+01	1.13E+00	1.40E+02	1.40E+01	4.22E+01	4.22E+00	1.76E+02	1.76E+01
Mercury	7439-97-6	9.00E-01	4.50E-01	Japanese Quail	ORNL 1996	132	13.2	mink	1	ORNL 1996	9.00E-01	4.50E-01	9.00E-01	4.50E-01	3.01E+02	3.01E+01	9.05E+01	9.05E+00	3.77E+02	3.77E+01
Nickel	7440-02-0	1.07E+02	7.74E+01	mallard duckling	ORNL 1996	80	40	rat	0.35	ORNL 1996	1.07E+02	7.74E+01	1.07E+02	7.74E+01	1.40E+02	7.01E+01	4.22E+01	2.11E+01	1.76E+02	8.79E+01
Selenium	7782-49-2	8.00E-01	4.00E-01	mallard duck	ORNL 1996	0.33	0.2	rat	0.35	ORNL 1996	8.00E-01	4.00E-01	8.00E-01	4.00E-01	5.79E-01	3.51E-01	1.74E-01	1.05E-01	7.25E-01	4.40E-01
Silver	7440-22-4	1.24E+02	1.66E+01	turkey	Matuk et al. 1981	222	22.2	rat	0.35	Matuk et al. 1981	1.24E+02	1.66E+01	1.24E+02	1.66E+01	3.89E+02	3.89E+01	1.17E+02	1.17E+01	4.88E+02	4.88E+01
Zinc	7440-66-6	1.31E+02	1.45E+01	white leghorn hen	ORNL 1996	320	160	rat	0.35	ORNL 1996	1.31E+02	1.45E+01	1.31E+02	1.45E+01	5.61E+02	2.81E+02	1.69E+02	8.44E+01	7.03E+02	3.52E+02
PAHS																				
Acenaphthene	83-32-9	5.05E+00	1.01E+00	red-winged blackbird	USACE 1998	87.5	17.5	mouse	0.03	USACE 1998	5.05E+00	1.01E+00	5.05E+00	1.01E+00	8.30E+01	1.66E+01	2.50E+01	4.99E+00	1.04E+02	2.08E+01
Acenaphthylene	208-96-8	--	--	--	USACE 1998	500	100	rat	0.35	USACE 1998	NV	NV	NV	NV	8.77E+02	1.75E+02	2.64E+02	5.27E+01	1.10E+03	2.20E+02
Benzo(a)anthracene	56-55-3	--	--	--	USACE 1998	2	0.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	2.91E+00	2.91E-01	8.74E-01	8.74E-02	3.64E+00	3.64E-01
Benzo(a)pyrene	50-32-8	2.50E+00	5.00E-01	duck	ORNL 1996	10	1	mouse	0.03	ORNL 1996	2.50E+00	5.00E-01	2.50E+00	5.00E-01	9.49E+00	9.49E-01	2.85E+00	2.85E-01	1.19E+01	1.19E+00
Benzo(b)fluoranthene	205-99-2	--	--	--	ORNL 1996	10	1	mouse	0.03	ORNL 1996	NV	NV	NV	NV	9.49E+00	9.49E-01	2.85E+00	2.85E-01	1.19E+01	1.19E+00
Benzo(g,h,i)perylene	191-24-2	--	--	--	USACE 1998	2.5	0.5	mouse	0.03	USACE 1998	NV	NV	NV	NV	2.37E+00	4.74E-01	7.13E-01	1.43E-01	2.97E+00	5.95E-01
Benzo(k)fluoranthene	207-08-9	--	--	--	USACE 1998	72	7.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.05E+02	1.05E+01	3.15E+01	3.15E+00	1.31E+02	1.31E+01
Chrysene	218-01-9	--	--	--	USACE 1998	99	9.9	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.44E+02	1.44E+01	4.32E+01	4.32E+00	1.80E+02	1.80E+01
Dibenzo(a,h)anthracene	53-70-3	--	--	--	USACE 1998	13.33	1.333	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.94E+01	1.94E+00	5.82E+00	5.82E-01	2.43E+01	2.43E+00
Fluoranthene	206-44-0	--	--	--	USACE 1998	100	20	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.45E+02	2.91E+01	4.37E+01	8.74E+00	1.82E+02	3.64E+01
Indeno(1,2,3-cd)pyrene	193-39-5	--	--	--	USACE 1998	72	7.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.05E+02	1.05E+01	3.15E+01	3.15E+00	1.31E+02	1.31E+01
Phenanthrene	85-01-8	5.65E+00	1.13E+00	red-winged blackbird	USACE 1998	35	7	mouse	0.03	USACE 1998	5.65E+00	1.13E+00	5.65E+00	1.13E+00	3.32E+01	6.64E+00	9.98E+00	2.00E+00	4.16E+01	8.32E+00
Pyrene	129-00-0	--	--	--	USACE 1998	40	8	mouse	0.03	USACE 1998	NV	NV	NV	NV	3.80E+01	7.59E+00	1.14E+01	2.28E+00	4.76E+01	9.51E+00
Pesticides																				
4,4'-DDE	72-55-9	5.80E-01	5.80E-02	mallard duck	Kornbrust et al. 1986	230	23	rat	0.35	Kornbrust et al. 1986	5.80E-01	5.80E-02	5.80E-01	5.80E-02	4.03E+02	4.03E+01	1.21E+02	1.21E+01	5.06E+02	5.06E+01
alpha-Chlordane	5103-71-9	1.07E+01	2.14E+00	red-winged blackbird	Chlordane Value	3.9	0.39	mouse	0.03	ATSDR 1994	1.07E+01	2.14E+00	1.07E+01	2.14E+00	3.70E+00	3.70E-01	1.11E+00	1.11E-01	4.64E+00	4.64E-01
delta-BHC	319-86-8	2.25E+00	5.60E-01	Japanese quail	ORNL 1996	0.14	0.014	mink	1	ORNL 1996	2.25E+00	5.60E-01	2.25E+00	5.60E-01	3.19E-01	3.19E-02	9.60E-02	9.60E-03	4.00E-01	4.00E-02
Dieldrin	60-57-1	7.70E-01	7.70E-02	barn owl	ORNL 1996	0.2	0.02	rat	0.35	ORNL 1996	7.70E-01	7.70E-02	7.70E-01	7.70E-02	3.51E-01	3.51E-02	1.05E-01	1.05E-02	4.40E-01	4.40E-02
Endrin aldehyde	7421-93-4	1.70E-01	2.80E-02	mallard duck	Endrin Value	0.92	0.092	mouse	0.03	Endrin Value	1.70E-01	2.80E-02	1.70E-01	2.80E-02	8.73E-01	8.73E-02	2.62E-01	2.62E-02	1.09E+00	1.09E-01
Endrin ketone	53494-70-5	1.70E-01	2.80E-02	mallard duck	Endrin Value	0.92	0.092	mouse	0.03	Endrin Value	1.70E-01	2.80E-02	1.70E-01	2.80E-02	8.73E-01	8.73E-02	2.62E-01	2.62E-02	1.09E+00	1.09E-01
gamma-Chlordane	5103-74-2	1.06E+01	2.14E+00	red-winged blackbird	Chlordane Value	3.9	0.39	mouse	0.03	ATSDR 1994	1.06E+01	2.14E+00	1.06E+01	2.14E+00	3.70E+00	3.70E-01	1.11E+00	1.11E-01	4.64E+00	4.64E-01
Heptachlor epoxide	1024-57-3	4.95E+00	9.90E-01	Japanese quail	USACE 1998	0.25	0.025	rat	0.35	USACE 1998	4.95E+00	9.90E-01	4.95E+00	9.90E-01	4.38E-01	4.38E-02	1.32E-01	1.32E-02	5.49E-01	5.49E-02
Methoxychlor	72-43-5	1.45E+02	1.45E+01	adult chicken	ORNL 1996	8	4	rat	0.35	ORNL 1996	1.45E+02	1.45E+01	1.45E+02	1.45E+01	1.40E+01	7.01E+00	4.22E+00	2.11E+00	1.76E+01	8.79E+00
PCBs																				
Aroclor 1254	11097-69-1	4.10E+00	4.10E-01	screech owl	Aroclor 1242 Value	0.68	0.068	oldfield mouse	0.03	ORNL 1996	4.10E+00	4.10E-01	4.10E+00	4.10E-01	6.45E-01	6.45E-02	1.94E-01	1.94E-02	8.09E-01	8.09E-02
Aroclor 1260	11096-82-5	4.10E+00	4.10E-01	screech owl	Aroclor 1242 Value	0.68	0.068	oldfield mouse	0.03	ORNL 1996	4.10E+00	4.10E-01	4.10E+00	4.10E-01	6.45E-01	6.45E-02	1.94E-01	1.94E-02	8.09E-01	8.09E-02
Explosives																				
1,3,5-Trinitrobenzene[4]	99-35-4	--	--	--	--	13.31	2.68	Rat	0.325	USCHPPM 2001a	NV	NV	NV	NV	2.29E+01	4.61E+00	6.89E+00	1.39E+00	2.87E+01	5.78E+00
2,4,6-Trinitrotoluene[5,7]	118-96-7	1.8	0.07	Northern Bobwhite	USCHPPM 2001b	8	2	Dog (beagle)	14	USCHPM 2001b (Levine et al. 1990)	1.80E+00	7.00E-02	1.80E+00	7.00E-02	3.53E+01	8.82E+00	1.06E+01	2.65E+00	4.42E+01	1.11E+01
2,4-Dinitrotoluene[1]	121-14-2	1.25	0.1	Northern Bobwhite	Johnson et al. 2005a	--	--	--	--	--	1.25E+00	1.00E-01	1.25E+00	1.00E-01	NV	NV	NV	NV	NV	NV
2-Amino-4,6-dinitrotoluene[4]	355-72-78-2	--	--	--	--	48	9	Rat	0.325	USCHPPM 2005	NV	NV	NV	NV	8.26E+01	1.55E+01	2.48E+01	4.66E+00	1.04E+02	1.94E+01
4-Amino-2,6-dinitrotoluene[4]	1946-51-0	--	--	--	--	48	9	Rat	0.325	USCHPPM 2005	NV	NV	NV	NV	8.26E+01	1.55E+01	2.48E+01	4.66E+00	1.04E+02	1.94E+01
RDX[3,4,5]	121-82-4	26	2.6	Northern Bobwhite	USCHPPM 2002 (Gogal et al. 2001)	39.8	8	Rat	0.325	USCHPPM 2002 (Levine et al. 1983)	2.60E+01	2.60E+00	2.60E+01	2.60E+00	6.85E+01	1.38E+01	2.06E+01	4.14E+00	8.59E+01	1.73E+01
Nitroglycerin[4]	55-63-0	--	--	--	--	32	3	Rat	0.325	USCHPPM 2007	NV	NV	NV	NV	5.51E+01	5.16E+00	1.66E+01	1.55E+00	6.90E+01	6.47E+00
Dioxin/Furans																				
2,3,7,8-TCDD	1746-01-6	1.40E-04	1.40E-05	ring-necked pheasant	ORNL 1996	0.00001	0.000001	mouse	0.03	ORNL 1996	1.40E-04	1.40E-05	1.40E-04	1.40E-05	9.49E-06	9.49E-07	2.85E-06	2.85E-07	1.19E-05	1.19E-06

Table F.3-10
Wildlife TRVs and Sources
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

CAS = Chemical Abstract Service
TRV = Toxic Reference Value
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw/d = Body Weight Per Day
kg = kilogram
PAH = Polynuclear Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
USACE = U.S. Army Corps of Engineers
ORNL = Oak Ridge National Laboratory
LD_{50} = Lethal Dose for 50% of test organisms
NOAEL and LOAEL values were derived from acute values by applying an uncertainty factor of 150.

Sources:

ATSDR 1994. ATSDR. 1994. Toxicological profile for Chlordane Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry.
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[1] - Avian TRVs derived from subchronic NOAEL value of 1 and subchronic LOAEL value of 5 from a northern bobwhite and applying an uncertainty factor of 10 and 4 to derive NOAEL-based and LOAEL-based TRVs.
[2] - Used 2,4-dinitrotoluene avian TRVs as surrogate.
[3] - Avian chronic
[4]- Mature rat body weight (average male & female) = 0.325 kg (U.S. EPA, 1988).
[5]- Mature Bobwhite Body Weight (seasonal average) = 0.191 kg (U.S. EPA, 1993).
[6]- Mature mouse body weight (female) = 0.035 kg (U.S.EPA, 1988).
[7]- Mature dog body weight (average male & female) = 14 kg (U.S. EPA, 1988).

Table F.3-11
Soil Bioaccumulation Factors - Soil to Plant Pathway
Screening Level Ecological Risk Assessment - Area B
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Chemical	CAS	Log K_{ow} Range	Selected K_{ow}	Source	Preliminary Assessment		Refined Assessment			Source
					BAF	Basis	C_s EPC (mg/kg)	BAF[1]	Basis	
Inorganics										
ARSENIC	7440-38-2	-- - --	--	--	1.103	90th percentile	2.08	0.0375	Median	Bechtel Jacobs 1998
CADMIUM	7440-43-9	-- - --	--	--	3.25	90th percentile	0.18	1.3512	$C_p = e^{(0.546*\ln(Cs) - 0.475)}$	Bechtel Jacobs 1998
CHROMIUM	7440-47-3	-- - --	--	--	0.084	90th percentile	25.00	0.0410	Median	Bechtel Jacobs 1998
COPPER	7440-50-8	-- - --	--	--	0.625	90th percentile	58.80	0.1651	$C_p = e^{(0.394*\ln(Cs) + 0.668)}$	Bechtel Jacobs 1998
LEAD	7439-92-1	-- - --	--	--	0.468	90th percentile	2581.00	0.0084	$C_p = e^{(0.561*\ln(Cs) - 1.328)}$	Bechtel Jacobs 1998
MERCURY	7439-97-6	-- - --	--	--	5.0	90th percentile	0.29	0.6491	$C_p = e^{(0.544*\ln(Cs) - 0.995)}$	Bechtel Jacobs 1998
NICKEL	7440-02-0	-- - --	--	--	1.411	90th percentile	NC	NC	$C_p = e^{(0.748*\ln(Cs) + 2.223)}$	Bechtel Jacobs 1998
SELENIUM	7782-49-2	-- - --	--	--	3.012	90th percentile	1.53	0.5311	$C_p = e^{(1.104*\ln(Cs) - 0.677)}$	Bechtel Jacobs 1998
SILVER	7440-22-4	-- - --	--	--	0.037	90th percentile	NC	0.0140	Median	Bechtel Jacobs 1998
ZINC	7440-66-6	-- - --	--	--	1.82	90th percentile	272.00	0.3965	$C_p = e^{(0.554*\ln(Cs) + 1.575)}$	Bechtel Jacobs 1998
Pesticides										
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	0.08	Maximum	0.06	0.1628	$C_p = e^{(0.752*\ln(Cs) - 2.512)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	0.0086	K_{ow} Regression Eq.	Travis and Arms 1988
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	1	Default Value	NC	0.1653	K_{ow} Regression Eq.	Travis and Arms 1988
DIELDRIN	60-57-1	3.63 - 6.2	5.37	USEPA 1995	1	Default Value	0.00432	0.41	Median	USEPA 2005
ENDRIN KETONE	53494-70-5	-- - --	--	--	1	Default Value	NC	0.0461	Endrin as Surrogate	--
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	0.0086	K_{ow} Regression Eq.	Travis and Arms 1988
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	1	Default Value	NC	0.0093	K_{ow} Regression Eq.	Travis and Arms 1988
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1	Default Value	0.01	0.0499	K_{ow} Regression Eq.	Travis and Arms 1988
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	1	Default Value	NC	0.0448	K_{ow} Regression Eq.	Travis and Arms 1988
PCBs										
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	0.0068	K_{ow} Regression Eq.	0.86	0.0068	K_{ow} Regression Eq.	Travis and Arms 1988
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	0.0045	K_{ow} Regression Eq.	0.36	0.0045	K_{ow} Regression Eq.	Travis and Arms 1988
VOCs and SVOCs										
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	4.6	Anthracene as Surrogate	1.09	0.0033	$C_p = e^{(-0.8556*\ln(Cs) - 5.562)}$	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.1	USEPA 1995	4.6	Anthracene as Surrogate	0.04	0.6167	$C_p = e^{(0.791*\ln(Cs) - 1.144)}$	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	0.54	Maximum	NC	NC	$C_p = e^{(0.5944*\ln(Cs) - 2.708)}$	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	3.3	Maximum	0.02	0.1403	$C_p = e^{(0.975*\ln(Cs) - 2.0615)}$	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	0.48	Maximum	NC	0.31	Median BAF	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1.6	Maximum	NC	NC	$C_p = e^{(1.183*\ln(Cs) - 0.931)}$	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	1.0	Maximum	NC	NC	$C_p = e^{(0.860*\ln(Cs) - 2.158)}$	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	1.05	Maximum	NC	NC	$C_p = e^{(0.594*\ln(Cs) - 2.708)}$	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	0.23	Maximum	NC	0.13	Median BAF	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	5.12	USEPA 1995	6.0	Maximum	NC	0.50	Median BAF	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.65	USEPA 1995	0.15	Maximum	NC	0.11	Median BAF	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	11	Maximum	NC	NC	$C_p = e^{(0.620*\ln(Cs) - 0.167)}$	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	5.11	USEPA 1995	3.7	Maximum	NC	0.72	Median BAF	USEPA 2005
Explosives										
1,3,5-TNB	99-35-4	-- - --	1.6	SRC	8.46	TNT as surrogate	1.9	4.23	TNT as surrogate	--
2,4-DNT	121-14-2	-- - --	1.6	SRC	8.46	TNT as surrogate	9.533	4.23	TNT as surrogate	--
2,4,6-TNT	118-96-7	-- - --	1.6	SRC	8.46	Maximum	20.26	4.23	Median BAF	USEPA 2005
2-AMINO-4,6-DINITROTOLUENE	355-72-78-2	-- - --	1.6	SRC	8.46	TNT as surrogate	1.61	4.23	TNT as surrogate	--
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	-- - --	1.6	SRC	8.46	TNT as surrogate	2.32	4.23	TNT as surrogate	--
RDX	121-82-4	-- - --	0.87	SRC	5.26	90th pecentile	1.51	0.43	Median BAF	USEPA 2005
NITROGLYCERIN	55-63-0	-- - --	1.6	SRC	1	Default Value	400	1	Default Value	--
Dioxin/Furans										
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	0.0075	K_{ow} Regression Eq.	NC	0.0065	K_{ow} Regression Eq.	Travis and Arms 1988

Table F.3-11
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Notes:

CAS = Chemical Abstract Services
BAF = Bioaccumulation Factor
K_{ow} = Chemical octanol-water coefficient
NC = Not Calculated
C_s = Chemical Concentration in Soil
C_p = Chemical Concentration in Plant Matter (dry weight)
[1] = BAFs for chemical using Cp regression equation calculated by as follows: BAF = C_p/C_s

References:

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USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.

Travis and Arms 1988: Travis and Arms. 1988. Bioconcentration of Organics in Beef, Milk, and Vegetation. BAF values calculated for Tier I using lowest Kow value and for Tier II using the selected Kow value.
K_{ow} Regression Equation: BAF =10^((-0.578*K_{ow})+1.588))

SRC/CF: Syracuse Research Corporation (SRC). Physical Properties Database. http://www.syrres.com/esc/physdemo.htm

Table F.3-12
Soil Bioaccumulation Factors - Soil to Invertebrates Pathway
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							Preliminary Assessment		Refined Assessment			
Chemical	**CAS**	**Log K_{ow} Range**	**Selected Log K_{ow}**	**Reference**	**K_{oc}**	**Reference**	**Value**	**Basis**	**C_s EPC (mg/kg)**	**BAF[1]**	**Basis**	**Source**
Inorganics												
ARSENIC	7440-38-2	-- - --	--	--	--	--	0.52	90th percentile	2.08	0.1947	$C_e = e^{(0.706*\ln(Cs) - 1.421)}$	Sample et al. 1998
CADMIUM	7440-43-9	-- - --	--	--	--	--	40.7	90th percentile	0.181	11.7564	$C_e = e^{(0.795*\ln(Cs) + 2.114)}$	Sample et al. 1998
CHROMIUM	7440-47-3	-- - --	--	--	--	--	3.16	90th percentile	25	0.31	Median	Sample et al. 1998
COPPER	7440-50-8	-- - --	--	--	--	--	1.53	90th percentile	58.8	0.52	Median	Sample et al. 1998
LEAD	7439-92-1	-- - --	--	--	--	--	1.52	90th percentile	2581	0.1765	$C_e = e^{(0.807*\ln(Cs) - 0.218)}$	Sample et al. 1998
MERCURY	7439-97-6	-- - --	--	--	--	--	20.6	90th percentile	0.291	1.69	Median	Sample et al. 1998
NICKEL	7440-02-0	-- - --	--	--	--	--	4.73	90th percentile	NC	1.06	Median	Sample et al. 1998
SELENIUM	7782-49-2	-- - --	--	--	--	--	1.34	90th percentile	1.53	0.8282	$C_e = e^{(0.733*\ln(Cs) - 0.075)}$	Sample et al. 1998
SILVER	7440-22-4	-- - --	--	--	--	--	15.3	90th percentile	NC	2.05	Median	Sample et al. 1998
ZINC	7440-66-6	-- - --	--	--	--	--	12.9	90th percentile	272	1.9776	$C_e = e^{(0.328*\ln(Cs) + 4.449)}$	Sample et al. 1998
Pesticides												
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	--	--	20.1	90th percentile	0.06	16.6696	$C_e = e^{(0.88*\ln(Cs) + 2.4771)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	5.89E+04	SRC, CF	4.00	Not Specified	NC	4.00	Not Specified	Edwards and Bohlen 1992
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	4.26E+03	SRC, CF	2.58	Jager Model	NC	2.58	Jager Model	USEPA 2005
DIELDRIN	60-57-1	3.63 - 6.2	5.37	USEPA 1995	--	--	79.6	Maximum	0.00432	16.5811	$C_e = e^{(0.876*\ln(Cs) + 2.276)}$	USEPA 2005
ENDRIN KETONE	53494-70-5	-- - --	--	--	--	--	3.60	Endrin as Surrogate	NC	3.60	Endrin as Surrogate	--
GAMMA-CHLORDANE	5103-74-2	5.8 - 6.41	6.32	USEPA 1995	5.89E+04	SRC, CF	4.00	Not Specified	NC	4.00	Not Specified	Edwards and Bohlen 1992
HEPTACHLOR	76-44-8	4.93 - 6.26	6.26	USEPA 1995	3.48E+03	SRC, CF	3.00	Not Specified	NC	3.00	Not Specified	Edwards and Bohlen 1992
HEPTACHLOR EPOXIDE	1024-57-3	3.5 - 5.4	5	USEPA 1995	1.06E+01	SRC, CF	8.39	Not Specified	0.0111	8.39	Not Specified	USEPA 1999
METHOXYCHLOR	72-43-5	4.2 - 5.6	5.08	USEPA 1995	8.00E+04	SRC, CF	2.77	Jager Model	NC	0.98	Jager Model	USEPA 2005
PCBs												
AROCLOR-1016	12674-11-2	-- - --	5.6	Jones et al. 1997	--	--	15.9	90th percentile	NC	6.67	Median	Sample et al. 1998
AROCLOR-1221	11104-28-2	-- - --	4.7	Jones et al. 1997	--	--	15.9	90th percentile	NC	6.67	Median	Sample et al. 1998
AROCLOR-1232	11141-16-5	-- - --	5.1	Jones et al. 1997	--	--	15.9	90th percentile	NC	6.67	Median	Sample et al. 1998
AROCLOR-1242	53469-21-9	-- - --	5.6	Jones et al. 1997	--	--	15.9	90th percentile	NC	6.67	Median	Sample et al. 1998
AROCLOR-1248	12672-29-6	-- - --	6.2	Jones et al. 1997	--	--	15.9	90th percentile	NC	6.67	Median	Sample et al. 1998
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	--	--	15.9	90th percentile	0.856	6.67	Median	Sample et al. 1998
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	--	--	15.9	90th percentile	0.358	6.67	Median	Sample et al. 1998
VOCs and SVOCs												
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	1.09E+04	USEPA 2005	2.20	Jager Model	1.091	0.70	Jager Model	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.07	USEPA 1995	9.47E+02	USEPA 2005	10.92	Jager Model	0.0424	10.92	Jager Model	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	3.58E+05	USEPA 2005	0.91	Jager Model	NC	0.76	Jager Model	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	9.69E+05	USEPA 2005	1.01	Jager Model	0.02	0.64	Jager Model	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	5.96E+05	USEPA 2005	1.85	Jager Model	NC	1.24	Jager Model	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1.43E+06	USEPA 2005	2.83	Jager Model	NC	1.40	Jager Model	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	5.96E+05	USEPA 2005	1.42	Jager Model	NC	1.24	Jager Model	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	2.48E+05	USEPA 2005	1.31	Jager Model	NC	1.09	Jager Model	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	1.79E+06	USEPA 2005	1.61	Jager Model	NC	1.10	Jager Model	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	4.95	USEPA 1995	4.17E+04	USEPA 2005	3.49	Jager Model	NC	1.45	Jager Model	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.58	USEPA 1995	1.17E+06	USEPA 2005	1.79	Jager Model	NC	1.36	Jager Model	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	3.30E+04	USEPA 2005	0.85	Jager Model	NC	0.82	Jager Model	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	4.88	USEPA 1995	6.27E+04	USEPA 2005	3.01	Jager Model	NC	0.84	Jager Model	USEPA 2005
Explosives												
1,3,5-TNB	99-35-4	-- - --	--	--	--	--	1	Default Value	1.9	1	Default Value	USEPA 2005
2,4-DNT	121-14-2	-- - --	--	--	--	--	1	Default Value	9.533	1	Default Value	USEPA 2005
2,4,6-TNT	118-96-7	-- - --	--	--	--	--	1	Default Value	20.26	1	Default Value	USEPA 2005
2-AMINO-4,6-DINITROTOLUENE	355-72-78-2	-- - --	--	--	--	--	1	Default Value	1.61	1	Default Value	USEPA 2005
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	-- - --	--	--	--	--	1	Default Value	2.32	1	Default Value	USEPA 2005
RDX	121-82-4	-- - --	--	--	--	--	1	Default Value	1.51	1	Default Value	USEPA 2005
NITROGLYCERIN	55-63-0	-- - --	--	--	--	--	1	Default Value	400	1	Default Value	USEPA 2005
Dioxin/Furans												
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	--	--	22.2	90th percentile	NC	11	Median	Sample et al. 1998

Notes:

CAS = Chemical Abstract Services

C_s = Chemical Concentration in Soil

C_e = Chemical Concentration in Earthworm (dry weight)

K_{ow} = Chemical octanol-water coefficient

K_{oc} = Chemical water to soil partitioning coefficient

K_{ww} = Chemical worm to soil partitioning coefficient

foc = mean fraction organic content in soil

[1] = BAFs for chemical using Ce regression equation calculated by as follows: BAF = C_e/C_s

Table F.3-12
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References:

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Sample et al. 1998: Sample, B.E., Beauchamp, J.J., Efroymson, R.A., Sutter, G.W., Ashwood, T.L., February 1998. Development and Validation of Bioaccumulation Models for Earthworms.

Jager Model: As presented in USEPA 2005, Guidance for Developing Ecological Screening Levels, Appendix 4-1, Table 5.

BAF = K_{ww}(L/kg worl dw)/K_d (L/kg soil dw)

K_{ww} (dry weight) = 10^(0.87*logK_{ow} - 2.0) / 0.16

Wet weight to dry weight assuming 16% solids

$K_d = f_{oc} * K_{oc}$

foc = 0.021 from site specific physical soil data

Note: The maximum Kow utilized for the Tier I calculation and the Selected Kow utilized for the Tier II calculation.

Edwards and Bohlen 1992: Edwards, C.A. and Bohlen, P.J. 1992. The effects of toxic chemicals on earthworms. Reviews of Environmental Contamination and Toxicology, 125: 23-99.

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SRC/CF: Syracuse Research Corporation (SRC). Physical Properties Database. http://www.syrres.com/esc/physdemo.htm

Table F.3-13
Soil Bioaccumulation Factors - Soil to Mammals Pathway
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

					Preliminary Assessment		Refined Assessment			
Chemical	**CAS**	**Log K_{ow} Range**	**Selected K_{ow}**	**Reference**	**Value**	**Basis**	**C_s (mg/kg)**	**BAF[1]**	**Basis**	**Source**
Inorganics										
ARSENIC	7440-38-2	-- - --	--	--	0.0149	90th percentile	2.08	0.0069	$C_m = e^{(0.819*\ln(Cs) - 4.847)}$	Sample et al. 1998
CADMIUM	7440-43-9	-- - --	--	--	3.991	90th percentile	0.181	0.7011	$C_m = e^{(0.472*\ln(Cs) - 1.257)}$	Sample et al. 1998
CHROMIUM	7440-47-3	-- - --	--	--	0.333	90th percentile	25	0.0986	$C_m = e^{(0.734*\ln(Cs) - 1.46)}$	Sample et al. 1998
COPPER	7440-50-8	-- - --	--	--	1.045	90th percentile	58.8	0.2360	$C_m = e^{(0.144*\ln(Cs) + 2.042)}$	Sample et al. 1998
LEAD	7439-92-1	-- - --	--	--	0.286	90th percentile	2581	0.0135	$C_m = e^{(0.442*\ln(Cs) + 0.0761)}$	Sample et al. 1998
MERCURY	7439-97-6	-- - --	--	--	0.192	90th percentile	0.291	0.0543	Median	Sample et al. 1998
NICKEL	7440-02-0	-- - --	--	--	0.589	90th percentile	NC	NC	$C_m = e^{(0.466*\ln(Cs) - 0.246)}$	Sample et al. 1998
SELENIUM	7782-49-2	-- - --	--	--	1.187	90th percentile	1.53	0.5061	$C_m = e^{(0.376*\ln(Cs) -0.416)}$	Sample et al. 1998
SILVER	7440-22-4	-- - --	--	--	0.501	90th percentile	NC	0.004	Median	Sample et al. 1998
ZINC	7440-66-6	-- - --	--	--	2.69	90th percentile	272	0.4288	$C_m = e^{(0.071*\ln(Cs) + 4.363)}$	Sample et al. 1998
Pesticides										
4,4'-DDE	72-55-9	5.63 - 6.96	6.76	USEPA 1995	1	Default Value	0.06	104.5970	$C_m = e^{(0.641*\ln(Cd) + 3.640)}$	USEPA 2005
ALPHA-CHLORDANE	5103-71-9	5.8 - 6.41	6.32	USEPA 1995	1	Default Value	NC	1	Default Value	--
DELTA-BHC	319-86-8	-- - --	4.1	USEPA 1996	1	Default Value	NC	1	Default Value	--
DIELDRIN	60-57-1	3.63 - 6.2	5.37	USEPA 1995	1	Default Value	0.00432	0.0005	$C_m = e^{(0.6076*\ln(Cs) - 1.9582)}$	USEPA 2005
ENDRIN ALDEHYDE	7421-93-4	-- - --	--	--	1	Default Value	NC	1	Default Value	--
ENDRIN KETONE	53494-70-5	-- - --	--	--	1	Default Value	NC	1	Default Value	--
AROCLOR-1254	11097-69-1	-- - --	6.5	Jones et al. 1997	1	Default Value	0.856	1	Default Value	--
AROCLOR-1260	11096-82-5	-- - --	6.8	Jones et al. 1997	1	Default Value	0.358	1	Default Value	--
VOCs and SVOCs										
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	1	Default Value	1.091	0	--	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.07	USEPA 1995	1	Default Value	0.0424	0	--	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	1	Default Value	0.02	0	--	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	5.12	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.65	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	5.11	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
Explosives										
1,3,5-TNB	99-35-4	-- - --	--	--	1	Default Value	1.9	0	TNT as surrogate	USEPA 2005
2,4-DNT	121-14-2	-- - --	--	--	1	Default Value	9.533	0	TNT as surrogate	USEPA 2005
2,4,6-TNT	118-96-7	-- - --	--	--	1	Default Value	20.26	0	Cm = 0	USEPA 2005
2-AMINO-4,6-DINITROTOLUENE	355-72-78-2	-- - --	--	--	1	Default Value	1.61	0	TNT as surrogate	USEPA 2005
4-AMINO-2,6-DINITROTOLUENE	1946-51-0	-- - --	--	--	1	Default Value	2.32	0	TNT as surrogate	USEPA 2005
RDX	121-82-4	-- - --	--	--	1	Default Value	1.51	0	Cm = 0	USEPA 2005
NITROGLYCERIN	55-63-0	-- - --	--	--	1	Default Value	400	0	TNT as surrogate	USEPA 2005
Dioxin/Furans										
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	2.2	90th percentile	0.0001832	0.9372	$C_m = e^{(0.1089*\ln(Cs) + 0.7044)}$	Sample et al. 1998

Notes:
CAS = Chemical Abstract Services
C_s = Chemical Concentration in Soil
C_d = Chemical Concentration in Prey (assumed to be 100% earthworms (dry weight))
C_m = Chemical Concentration in Mammal (dry weight)
K_{ow} = Chemical octanol to water partitioning coefficient
[1] = BAFs for chemical using Ce regression equation calculated by as follows: BAF = C_m/C_s

Table F.3-13
Soil Bioaccumulation Factors - Soil to Mammals Pathway
Screening Level Ecological Risk Assessment - Area B
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Radford Army Ammunition Plant, Radford, Virginia

References:

USEPA 1995: United States Environmental Protection Agency. Karickhoff, S.W. , and J.M. Long. 1995. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.

Sample et al. 1998: Sample et al. 1998. Development and Validation of Bioaccumulation Models for Small Mammals.

Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision

USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.

Travis and Arms 1988: Travis and Arms. 1988. Bioconcentration of Organics in Beef, Milk, and Vegetation. BAF values calculated for Tier I using lowest Kow value and for Tier II using the selected Kow value.

K_{ow} Regression Equation: BAF =10^((-0.578*K_{ow})+1.588))

Table F.3-14
Preliminary Wildlife Risk Characterization - Meadow Vole
Screening Level Ecological Risk Assessment - Area B
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Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics													
Arsenic	7440-38-2	1.20E-01	1.20E+00	5.1	1.1E+00	5.6E+00	1.8E-01	1.8E+00	**2.83E+01**	**2.8E+00**	**Y**	2.08	**1.2E+01**
Cadmium	7440-43-9	1.69E+00	1.69E+01	0.64	3.3E+00	2.1E+00	8.8E-01	8.8E+00	7.3E-01	7.3E-02	N	--	--
Chromium	7440-47-3	5.75E+00	5.75E+01	41.6	8.4E-02	3.5E+00	9.1E+01	9.1E+02	4.6E-01	4.6E-02	N	--	--
Copper	7440-50-8	2.67E+01	3.51E+01	195	6.3E-01	1.2E+02	7.0E+01	9.2E+01	**2.8E+00**	**2.1E+00**	**Y**	58.8	8.4E-01
Lead	7439-92-1	1.40E+01	1.40E+02	3,610	4.7E-01	1.7E+03	4.8E+01	4.8E+02	**7.4E+01**	**7.4E+00**	**Y**	2,581	**5.3E+01**
Mercury	7439-97-6	3.01E+01	3.01E+02	0.77	5.0E+00	3.9E+00	1.0E+01	1.0E+02	7.6E-02	7.6E-03	N	--	--
Nickel	7440-02-0	7.01E+01	1.40E+02	19.3	1.4E+00	2.7E+01	8.3E+01	1.7E+02	2.3E-01	1.2E-01	N	--	--
Selenium	7782-49-2	3.51E-01	5.79E-01	2.6	3.0E+00	7.8E+00	2.0E-01	3.2E-01	**1.3E+01**	**8.0E+00**	**Y**	1.53	**7.8E+00**
Silver	7440-22-4	3.89E+01	3.89E+02	0.11	3.7E-02	4.1E-03	1.1E+03	1.1E+04	1.0E-04	1.0E-05	N	--	--
Zinc	7440-66-6	2.81E+02	5.61E+02	555	1.8E+00	1.0E+03	2.6E+02	5.2E+02	**2.1E+00**	**1.1E+00**	**Y**	272	**1.1E+00**
Dioxin/Furans													
Total 2,3,7,8-TCDD Equivalents	1746-01-6	9.49E-07	9.49E-06	1.83E-04	7.5E-03	1.4E-06	5.1E-05	5.1E-04	**3.6E+00**	3.6E-01	**Y**	1.83E-04	**3.6E+00**
TCL Pesticides/PCBs													
4,4'-DDE	72-55-9	4.03E+01	4.03E+02	0.06	8.0E-02	4.8E-03	6.6E+02	6.6E+03	9.1E-05	9.1E-06	N	--	--
alpha-Chlordane	5103-71-9	3.70E-01	3.70E+00	0.062	1.0E+00	6.2E-02	6.1E-01	6.1E+00	1.0E-01	1.0E-02	N	--	--
delta-BHC	319-86-8	3.19E-02	3.19E-01	0.006	1.0E+00	6.0E-03	5.3E-02	5.3E-01	1.1E-01	1.1E-02	N	--	--
Dieldrin	60-57-1	3.51E-02	3.51E-01	0.011	1.0E+00	1.1E-02	5.8E-02	5.8E-01	1.9E-01	1.9E-02	N	--	--
Endrin aldehyde	7421-93-4	8.73E-02	8.73E-01	0.0044	1.0E+00	4.4E-03	1.4E-01	1.4E+00	3.0E-02	3.0E-03	N	--	--
Endrin ketone	53494-70-5	8.73E-02	8.73E-01	0.0075	1.0E+00	7.5E-03	1.4E-01	1.4E+00	5.2E-02	5.2E-03	N	--	--
gamma-Chlordane	5103-74-2	3.70E-01	3.70E+00	0.055	1.0E+00	5.5E-02	6.1E-01	6.1E+00	9.0E-02	9.0E-03	N	--	--
Heptachlor	76-44-8	2.28E-01	2.28E+00	0.0013	1.0E+00	1.3E-03	3.8E-01	3.8E+00	3.4E-03	3.4E-04	N	--	--
Heptachlor epoxide	1024-57-3	4.38E-02	4.38E-01	0.021	1.0E+00	2.1E-02	7.3E-02	7.3E-01	2.9E-01	2.9E-02	N	--	--
Methoxychlor	72-43-5	7.01E+00	1.40E+01	0.003	1.0E+00	3.0E-03	1.2E+01	2.3E+01	2.6E-04	1.3E-04	N	--	--
Aroclor 1254	11097-69-1	6.45E-02	6.45E-01	2.8	6.8E-03	1.9E-02	3.6E+00	3.6E+01	7.9E-01	7.9E-02	N	--	--
Aroclor 1260	11096-82-5	6.45E-02	6.45E-01	0.38	4.5E-03	1.7E-03	3.8E+00	3.8E+01	9.9E-02	9.9E-03	N	--	--
PAHs													
Acenaphthene	83-32-9	1.66E+01	8.30E+01	3.5	4.6E+00	1.6E+01	6.1E+00	3.1E+01	5.7E-01	1.1E-01	N	--	--
Acenaphthylene	208-96-8	1.75E+02	8.77E+02	0.24	4.6E+00	1.1E+00	6.4E+01	3.2E+02	3.7E-03	7.4E-04	N	--	--
Benzo(a)anthracene	56-55-3	2.91E-01	2.91E+00	0.015	5.4E-01	8.1E-03	8.8E-01	8.8E+00	1.7E-02	1.7E-03	N	--	--
Benzo(a)pyrene	50-32-8	9.49E-01	9.49E+00	0.057	3.3E+00	1.9E-01	4.9E-01	4.9E+00	1.2E-01	1.2E-02	N	--	--
Benzo(b)fluoranthene	205-99-2	9.49E-01	9.49E+00	0.1	4.8E-01	4.8E-02	3.2E+00	3.2E+01	3.1E-02	3.1E-03	N	--	--
Benzo(g,h,i)perylene	191-24-2	4.74E-01	2.37E+00	0.084	1.6E+00	1.3E-01	5.0E-01	2.5E+00	1.7E-01	3.4E-02	N	--	--
Benzo(k)fluoranthene	207-08-9	1.05E+01	1.05E+02	0.032	1.0E+00	3.2E-02	1.7E+01	1.7E+02	1.8E-03	1.8E-04	N	--	--
Chrysene	218-01-9	1.44E+01	1.44E+02	0.042	1.1E+00	4.4E-02	2.3E+01	2.3E+02	1.8E-03	1.8E-04	N	--	--
Dibenz(a,h)anthracene	53-70-3	1.94E+00	1.94E+01	0.0089	2.3E-01	2.0E-03	1.3E+01	1.3E+02	6.9E-04	6.9E-05	N	--	--
Fluoranthene	206-44-0	2.91E+01	1.45E+02	0.072	6.0E+00	4.3E-01	8.2E+00	4.1E+01	8.8E-03	1.8E-03	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	1.05E+01	1.05E+02	0.035	1.5E-01	5.3E-03	1.0E+02	1.0E+03	3.4E-04	3.4E-05	N	--	--
Phenanthrene	85-01-8	6.64E+00	3.32E+01	0.025	1.1E+01	2.8E-01	1.0E+00	5.1E+00	2.4E-02	4.9E-03	N	--	--
Pyrene	129-00-0	7.59E+00	3.80E+01	0.065	3.7E+00	2.4E-01	3.5E+00	1.7E+01	1.9E-02	3.8E-03	N	--	--
Explosives													
1,3,5-Trinitrobenzene	99-35-4	4.61E+00	2.29E+01	1.9	8.5E+00	1.6E+01	9.2E-01	4.6E+00	**2.1E+00**	4.1E-01	**Y**	1.90	**2.1E+00**
2,4,6-Trinitrotoluene	118-96-7	8.82E+00	3.53E+01	80	8.5E+00	6.8E+02	1.8E+00	7.1E+00	**4.5E+01**	**1.1E+01**	**Y**	20.26	**1.1E+01**
2,4-Dinitrotoluene	121-14-2	NV	NV	11	8.5E+00	9.3E+01	--	--	**--**	**--**	--	--	--
2-Amino-4,6-Dinitrotoluene	355-72-78-2	1.55E+01	8.26E+01	9.6	8.5E+00	8.1E+01	3.1E+00	1.7E+01	**3.1E+00**	5.8E-01	**Y**	1.61	5.2E-01
4-Amino-2,6-Dinitrotoluene	1946-51-0	1.55E+01	8.26E+01	14	8.5E+00	1.2E+02	3.1E+00	1.7E+01	**4.5E+00**	8.5E-01	**Y**	2.32	7.5E-01
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	1.38E+01	6.85E+01	8.2	5.3E+00	4.3E+01	4.4E+00	2.2E+01	**1.9E+00**	3.7E-01	**Y**	1.51	3.4E-01
Nitroglycerin													
Nitroglycerin	55-63-0	5.16E+00	5.51E+01	400	1.0E+00	4.0E+02	8.6E+00	9.1E+01	**4.7E+01**	**4.4E+00**	**Y**	400	**4.7E+01**

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Meadow Vole Specific Data from Table F.3-9

BW=	0.017	kg
IR_{food} =	0.010	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00024	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.3-15
Refined Wildlife Risk Characterization - Meadow Vole
Screening Level Ecological Risk Assessment - Area B
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Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment						
				Soil						
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics										
Arsenic	7440-38-2	1.20E-01	1.20E+00	2.08	3.8E-02	7.8E-02	9.0E+00	9.0E+01	2.3E-01	2.3E-02
Copper	7440-50-8	2.67E+01	3.51E+01	58.8	1.7E-01	9.7E+00	6.5E+02	8.6E+02	9.0E-02	6.8E-02
Lead	7439-92-1	1.40E+01	1.40E+02	2,581	8.4E-03	2.2E+01	2.0E+03	2.0E+04	**1.3E+00**	1.3E-01
Selenium	7782-49-2	3.51E-01	5.79E-01	1.53	5.3E-01	8.1E-01	2.9E+00	4.8E+00	5.2E-01	3.2E-01
Zinc	7440-66-6	2.81E+02	5.61E+02	272	4.0E-01	1.1E+02	3.1E+03	6.2E+03	8.8E-02	4.4E-02
Dioxin/Furans										
Total 2,3,7,8-TCDD Equivalents	1746-01-6	9.49E-07	9.49E-06	1.83E-04	6.5E-03	1.2E-06	1.5E-04	1.5E-03	**1.3E+00**	1.3E-01
Explosives										
1,3,5-Trinitrobenzene	99-35-4	4.61E+00	2.29E+01	1.9	4.2E+00	8.0E+00	5.0E+00	2.5E+01	3.8E-01	7.6E-02
2,4,6-Trinitrotoluene	118-96-7	8.82E+00	3.53E+01	20.26	4.2E+00	8.6E+01	9.6E+00	3.8E+01	**2.1E+00**	5.3E-01
2-Amino-4,6-Dinitrotoluene	355-72-78-2	1.55E+01	8.26E+01	1.61	4.2E+00	6.8E+00	1.7E+01	9.0E+01	9.6E-02	1.8E-02
4-Amino-2,6-Dinitrotoluene	1946-51-0	1.55E+01	8.26E+01	2.32	4.2E+00	9.8E+00	1.7E+01	9.0E+01	1.4E-01	2.6E-02
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	1.38E+01	6.85E+01	1.51	4.3E-01	6.5E-01	1.4E+02	7.0E+02	1.1E-02	2.2E-03
Nitroglycerin										
Nitroglycerin	55-63-0	5.16E+00	5.51E+01	400	1.0E+00	4.0E+02	2.3E+01	2.5E+02	**1.7E+01**	**1.6E+00**

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Meadow Vole Specific Data from Table F.3-9

BW=	0.037	kg
IR_{food} =	0.008	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	1.00	unitless
IR_{soil} =	0.00019	kg dw/day
IR_{water} =	0.005	L/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.3-16
Preliminary Wildlife Risk Characterization - Short-tailed Shrew
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																
Arsenic	7440-38-2	1.50E-01	1.50E+00	5.1	1.1E+00	5.6E+00	5.2E-01	2.7E+00	Plant	5.1E-01	5.1E+00	**1.0E+01**	**1.0E+00**	**Y**	2.08	**4.1E+00**
Cadmium	7440-43-9	2.11E+00	2.11E+01	0.64	3.3E+00	2.1E+00	4.1E+01	2.6E+01	Invertebrate	2.2E-01	2.2E+00	**3.0E+00**	3.0E-01	**Y**	0.181	8.4E-01
Chromium	7440-47-3	7.21E+00	7.21E+01	41.6	8.4E-02	3.5E+00	3.2E+00	1.3E+02	Invertebrate	9.1E+00	9.1E+01	**4.6E+00**	4.6E-01	**Y**	25	**2.7E+00**
Copper	7440-50-8	3.34E+01	4.40E+01	195	6.3E-01	1.2E+02	1.5E+00	3.0E+02	Invertebrate	8.4E+01	1.1E+02	**2.3E+00**	**1.8E+00**	**Y**	58.8	7.0E-01
Lead	7439-92-1	1.76E+01	1.76E+02	3,610	4.7E-01	1.7E+03	1.5E+00	5.5E+03	Invertebrate	4.4E+01	4.4E+02	**8.1E+01**	**8.1E+00**	**Y**	2,581	**5.8E+01**
Mercury	7439-97-6	3.77E+01	3.77E+02	0.77	5.0E+00	3.9E+00	2.1E+01	1.6E+01	Invertebrate	7.6E+00	7.6E+01	1.0E-01	1.0E-02	N	--	--
Nickel	7440-02-0	8.79E+01	1.76E+02	19.3	1.4E+00	2.7E+01	4.7E+00	9.1E+01	Invertebrate	7.5E+01	1.5E+02	2.6E-01	1.3E-01	N	--	--
Selenium	7782-49-2	4.40E-01	7.25E-01	2.6	3.0E+00	7.8E+00	1.3E+00	3.5E+00	Plant	5.8E-01	9.6E-01	**4.5E+00**	**2.7E+00**	**Y**	1.53	**2.6E+00**
Silver	7440-22-4	4.88E+01	4.88E+02	0.11	3.7E-02	4.1E-03	1.5E+01	1.7E+00	Invertebrate	1.3E+01	1.3E+02	8.3E-03	8.3E-04	N	--	--
Zinc	7440-66-6	3.52E+02	7.03E+02	555	1.8E+00	1.0E+03	1.3E+01	7.2E+03	Invertebrate	1.1E+02	2.3E+02	**4.9E+00**	**2.5E+00**	**Y**	272	**2.4E+00**
Dioxin/Furans																
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.19E-06	1.19E-05	1.83E-04	7.5E-03	1.4E-06	2.2E+01	4.1E-03	Invertebrate	2.2E-07	2.2E-06	**8.3E+02**	**8.3E+01**	**Y**	1.83E-04	**8.3E+02**
TCL Pesticides/PCBs																
4,4'-DDE	72-55-9	5.06E+01	5.06E+02	0.06	8.0E-02	4.8E-03	2.0E+01	1.2E+00	Invertebrate	1.0E+01	1.0E+02	5.8E-03	5.8E-04	N	--	--
alpha-Chlordane	5103-71-9	4.64E-01	4.64E+00	0.062	1.0E+00	6.2E-02	4.0E+00	2.5E-01	Invertebrate	4.7E-01	4.7E+00	1.3E-01	1.3E-02	N	--	--
delta-BHC	319-86-8	4.00E-02	4.00E-01	0.006	1.0E+00	6.0E-03	2.6E+00	1.5E-02	Invertebrate	6.2E-02	6.2E-01	9.7E-02	9.7E-03	N	--	--
Dieldrin	60-57-1	4.40E-02	4.40E-01	0.011	1.0E+00	1.1E-02	8.0E+01	8.8E-01	Invertebrate	2.3E-03	2.3E-02	**4.8E+00**	4.8E-01	**Y**	0.00432	**1.9E+00**
Endrin aldehyde	7421-93-4	1.09E-01	1.09E+00	0.0044	1.0E+00	4.4E-03	3.6E+00	1.6E-02	Invertebrate	1.2E-01	1.2E+00	3.6E-02	3.6E-03	N	--	--
Endrin ketone	53494-70-5	1.09E-01	1.09E+00	0.0075	1.0E+00	7.5E-03	3.6E+00	2.7E-02	Invertebrate	1.2E-01	1.2E+00	6.1E-02	6.1E-03	N	--	--
gamma-Chlordane	5103-74-2	4.64E-01	4.64E+00	0.055	1.0E+00	5.5E-02	4.0E+00	2.2E-01	Invertebrate	4.7E-01	4.7E+00	1.2E-01	1.2E-02	N	--	--
Heptachlor	76-44-8	2.86E-01	2.86E+00	0.0013	1.0E+00	1.3E-03	3.0E+00	3.9E-03	Invertebrate	3.8E-01	3.8E+00	3.4E-03	3.4E-04	N	--	--
Heptachlor epoxide	1024-57-3	5.49E-02	5.49E-01	0.021	1.0E+00	2.1E-02	8.4E+00	1.8E-01	Invertebrate	2.7E-02	2.7E-01	7.8E-01	7.8E-02	N	--	--
Methoxychlor	72-43-5	8.79E+00	1.76E+01	0.003	1.0E+00	3.0E-03	2.8E+00	8.3E-03	Invertebrate	1.3E+01	2.5E+01	2.4E-04	1.2E-04	N	--	--
Aroclor 1254	11097-69-1	8.09E-02	8.09E-01	2.8	6.8E-03	1.9E-02	1.6E+01	4.5E+01	Invertebrate	2.1E-02	2.1E-01	**1.3E+02**	**1.3E+01**	**Y**	0.856	**4.1E+01**
Aroclor 1260	11096-82-5	8.09E-02	8.09E-01	0.38	4.5E-03	1.7E-03	1.6E+01	6.0E+00	Invertebrate	2.1E-02	2.1E-01	**1.8E+01**	**1.8E+00**	**Y**	0.358	**1.7E+01**
PAHs																
Acenaphthene	83-32-9	2.08E+01	1.04E+02	3.5	4.6E+00	1.6E+01	2.2E+00	7.7E+00	Plant	1.8E+01	9.2E+01	1.9E-01	3.8E-02	N	--	--
Acenaphthylene	208-96-8	2.20E+02	1.10E+03	0.24	4.6E+00	1.1E+00	1.1E+01	2.6E+00	Invertebrate	8.3E+01	4.1E+02	2.9E-03	5.8E-04	N	--	--
Benzo(a)anthracene	56-55-3	3.64E-01	3.64E+00	0.015	5.4E-01	8.1E-03	9.1E-01	1.4E-02	Invertebrate	1.5E+00	1.5E+01	1.0E-02	1.0E-03	N	--	--
Benzo(a)pyrene	50-32-8	1.19E+00	1.19E+01	0.057	3.3E+00	1.9E-01	1.0E+00	5.7E-02	Plant	1.4E+00	1.4E+01	3.9E-02	3.9E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	1.19E+00	1.19E+01	0.1	4.8E-01	4.8E-02	1.8E+00	1.8E-01	Invertebrate	2.5E+00	2.5E+01	4.0E-02	4.0E-03	N	--	--
Benzo(g,h,i)perylene	191-24-2	5.95E-01	2.97E+00	0.084	1.6E+00	1.3E-01	2.8E+00	2.4E-01	Invertebrate	8.4E-01	4.2E+00	1.0E-01	2.0E-02	N	--	--
Benzo(k)fluoranthene	207-08-9	1.31E+01	1.31E+02	0.032	1.0E+00	3.2E-02	1.4E+00	4.6E-02	Invertebrate	3.5E+01	3.5E+02	9.1E-04	9.1E-05	N	--	--
Chrysene	218-01-9	1.80E+01	1.80E+02	0.042	1.1E+00	4.4E-02	1.3E+00	5.5E-02	Invertebrate	5.2E+01	5.2E+02	8.0E-04	8.0E-05	N	--	--
Dibenz(a,h)anthracene	53-70-3	2.43E+00	2.43E+01	0.0089	2.3E-01	2.0E-03	1.6E+00	1.4E-02	Invertebrate	5.8E+00	5.8E+01	1.5E-03	1.5E-04	N	--	--
Fluoranthene	206-44-0	3.64E+01	1.82E+02	0.072	6.0E+00	4.3E-01	3.5E+00	2.5E-01	Plant	2.5E+01	1.2E+02	2.9E-03	5.8E-04	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	1.31E+01	1.31E+02	0.035	1.5E-01	5.3E-03	1.8E+00	6.3E-02	Invertebrate	2.9E+01	2.9E+02	1.2E-03	1.2E-04	N	--	--
Phenanthrene	85-01-8	8.32E+00	4.16E+01	0.025	1.1E+01	2.8E-01	8.5E-01	2.1E-02	Plant	3.1E+00	1.6E+01	8.0E-03	1.6E-03	N	--	--
Pyrene	129-00-0	9.51E+00	4.76E+01	0.065	3.7E+00	2.4E-01	3.0E+00	2.0E-01	Plant	1.0E+01	5.2E+01	6.3E-03	1.3E-03	N	--	--
Explosives																
1,3,5-Trinitrobenzene	99-35-4	5.78E+00	2.87E+01	1.9	8.5E+00	1.6E+01	1.0E+00	1.9E+00	Plant	2.8E+00	1.4E+01	6.8E-01	1.4E-01	N	--	--
2,4,6-Trinitrotoluene	118-96-7	1.11E+01	4.42E+01	80	8.5E+00	6.8E+02	1.0E+00	8.0E+01	Plant	5.4E+00	2.1E+01	**1.5E+01**	**3.7E+00**	**Y**	20.26	**3.8E+00**
2,4-Dinitrotoluene	121-14-2	NV	NV	11	8.5E+00	9.3E+01	1.0E+00	1.1E+01	Plant	--	--	**--**	**--**	--	--	--
2-Amino-4,6-Dinitrotoluene	355-72-78-2	1.94E+01	1.04E+02	9.6	8.5E+00	8.1E+01	1.0E+00	9.6E+00	Plant	9.4E+00	5.0E+01	**1.0E+00**	1.9E-01	**Y**	1.61	1.7E-01
4-Amino-2,6-Dinitrotoluene	1946-51-0	1.94E+01	1.04E+02	14	8.5E+00	1.2E+02	1.0E+00	1.4E+01	Plant	9.4E+00	5.0E+01	**1.5E+00**	2.8E-01	**Y**	2.32	2.5E-01
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	1.73E+01	8.59E+01	8.2	5.3E+00	4.3E+01	1.0E+00	8.2E+00	Plant	1.3E+01	6.6E+01	6.1E-01	1.2E-01	N	--	--
Nitroglycerin																
Nitroglycerin	55-63-0	6.47E+00	6.90E+01	400	1.0E+00	4.0E+02	1.0E+00	4.0E+02	Plant	2.4E+01	2.5E+02	**1.7E+01**	**1.6E+00**	**Y**	400	**1.7E+01**

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10
BW = Minimum Body Weigth of Receptor (kg)
IR_{food} = Maximum Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)
DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = 100% Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

Short-tailed Shrew Specific Data from Table F.3-9

BW=	0.0125	kg
IR_{food} =	0.003	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00039	kg dw/day
IR_{water} =	0.003	L/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Screening Level
LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Screening Level
EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.3-17
Refined Wildlife Risk Characterization - Short-tailed Shrew
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment								
				Soil								
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics												
Arsenic	7440-38-2	1.50E-01	1.50E+00	2.08	3.8E-02	7.8E-02	1.95E-01	4.0E-01	3.7E+00	3.7E+01	5.6E-01	5.6E-02
Cadmium	7440-43-9	2.11E+00	2.11E+01	0.181	1.4E+00	2.4E-01	1.2E+01	2.1E+00	1.5E+00	1.5E+01	1.2E-01	1.2E-02
Chromium	7440-47-3	7.21E+00	7.21E+01	25	4.1E-02	1.0E+00	3.1E-01	7.7E+00	1.4E+02	1.4E+03	1.8E-01	1.8E-02
Copper	7440-50-8	3.34E+01	4.40E+01	58.8	1.7E-01	9.7E+00	5.2E-01	3.0E+01	4.2E+02	5.5E+02	1.4E-01	1.1E-01
Lead	7439-92-1	1.76E+01	1.76E+02	2,581	8.4E-03	2.2E+01	1.8E-01	4.6E+02	4.7E+02	4.7E+03	**5.5E+00**	5.5E-01
Selenium	7782-49-2	4.40E-01	7.25E-01	1.53	5.3E-01	8.1E-01	8.3E-01	1.3E+00	3.6E+00	5.9E+00	4.3E-01	2.6E-01
Zinc	7440-66-6	3.52E+02	7.03E+02	272	4.0E-01	1.1E+02	2.0E+00	5.4E+02	1.4E+03	2.8E+03	1.9E-01	9.7E-02
Dioxin/Furans												
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.19E-06	1.19E-05	1.83E-04	6.5E-03	1.2E-06	1.1E+01	2.0E-03	9.3E-07	9.3E-06	**2.0E+02**	**2.0E+01**
TCL Pesticides/PCBs												
Dieldrin	60-57-1	4.40E-02	4.40E-01	0.00432	4.1E-01	1.8E-03	1.7E+01	7.2E-02	2.3E-02	2.3E-01	1.9E-01	1.9E-02
Aroclor 1254	11097-69-1	8.09E-02	8.09E-01	0.856	6.8E-03	5.8E-03	6.7E+00	5.7E+00	1.0E-01	1.0E+00	**8.3E+00**	8.3E-01
Aroclor 1260	11096-82-5	8.09E-02	8.09E-01	0.358	4.5E-03	1.6E-03	6.7E+00	2.4E+00	1.0E-01	1.0E+00	**3.5E+00**	3.5E-01
Explosives												
2,4,6-Trinitrotoluene	118-96-7	1.11E+01	4.42E+01	20.26	4.2E+00	8.6E+01	1.0E+00	2.0E+01	5.2E+01	2.1E+02	3.9E-01	9.7E-02
2-Amino-4,6-Dinitrotoluene	355-72-78-2	1.94E+01	1.04E+02	1.61	4.2E+00	6.8E+00	1.0E+00	1.6E+00	9.2E+01	4.9E+02	1.7E-02	3.3E-03
4-Amino-2,6-Dinitrotoluene	1946-51-0	1.94E+01	1.04E+02	2.32	4.2E+00	9.8E+00	1.0E+00	2.3E+00	9.2E+01	4.9E+02	2.5E-02	4.7E-03
Nitroglycerin												
Nitroglycerin	55-63-0	6.47E+00	6.90E+01	400	1.0E+00	4.0E+02	1.0E+00	4.0E+02	4.3E+01	4.6E+02	**9.3E+00**	8.7E-01

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Short-tailed Shrew Specific Data from Table F.3-9

BW=	0.015	kg
IR_{food} =	0.002	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.14	unitless
DF_{inv} =	0.86	unitless
IR_{soil} =	0.00026	kg dw/day
IR_{water} =	0.002	L/day
AF =	1.000	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

HQ = Hazard Quotient

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.3-18
Preliminary Wildlife Risk Characterization - Red Fox
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																		
Arsenic	7440-38-2	3.59E-02	3.59E-01	5.1	1.1E+00	5.6E+00	5.2E-01	2.7E+00	1.5E-02	7.6E-02	Plant	2.7E-01	2.7E+00	**1.9E+01**	**1.9E+00**	**Y**	2.08	**7.6E+00**
Cadmium	7440-43-9	5.07E-01	5.07E+00	0.64	3.3E+00	2.1E+00	4.1E+01	2.6E+01	4.0E+00	2.6E+00	Invertebrate	1.1E-01	1.1E+00	**6.0E+00**	6.0E-01	**Y**	0.181	**1.7E+00**
Chromium	7440-47-3	1.73E+00	1.73E+01	41.6	8.4E-02	3.5E+00	3.2E+00	1.3E+02	3.3E-01	1.4E+01	Invertebrate	4.7E+00	4.7E+01	**8.9E+00**	8.9E-01	**Y**	25	**5.3E+00**
Copper	7440-50-8	8.02E+00	1.06E+01	195	6.3E-01	1.2E+02	1.5E+00	3.0E+02	1.0E+00	2.0E+02	Invertebrate	4.4E+01	5.8E+01	**4.4E+00**	**3.3E+00**	**Y**	58.8	**1.3E+00**
Lead	7439-92-1	4.22E+00	4.22E+01	3,610	4.7E-01	1.7E+03	1.5E+00	5.5E+03	2.9E-01	1.0E+03	Invertebrate	2.3E+01	2.3E+02	**1.5E+02**	**1.5E+01**	**Y**	2,581	**1.1E+02**
Mercury	7439-97-6	9.05E+00	9.05E+01	0.77	5.0E+00	3.9E+00	2.1E+01	1.6E+01	1.9E-01	1.5E-01	Invertebrate	3.8E+00	3.8E+01	2.0E-01	2.0E-02	N	--	--
Nickel	7440-02-0	2.11E+01	4.22E+01	19.3	1.4E+00	2.7E+01	4.7E+00	9.1E+01	5.9E-01	1.1E+01	Invertebrate	3.8E+01	7.6E+01	5.0E-01	2.5E-01	N	--	--
Selenium	7782-49-2	1.05E-01	1.74E-01	2.6	3.0E+00	7.8E+00	1.3E+00	3.5E+00	1.2E+00	3.1E+00	Plant	3.0E-01	4.9E-01	**8.7E+00**	**5.3E+00**	**Y**	1.53	**5.1E+00**
Silver	7440-22-4	1.17E+01	1.17E+02	0.11	3.7E-02	4.1E-03	1.5E+01	1.7E+00	5.0E-01	5.5E-02	Invertebrate	6.6E+00	6.6E+01	1.7E-02	1.7E-03	N	--	--
Zinc	7440-66-6	8.44E+01	1.69E+02	555	1.8E+00	1.0E+03	1.3E+01	7.2E+03	2.7E+00	1.5E+03	Invertebrate	5.6E+01	1.1E+02	**9.8E+00**	**4.9E+00**	**Y**	272	**4.8E+00**
Dioxin/Furans																		
Total 2,3,7,8-TCDD Equivalents	1746-01-6	2.85E-07	2.85E-06	1.83E-04	7.5E-03	1.4E-06	2.2E+01	4.1E-03	2.2E+00	4.0E-04	Invertebrate	1.1E-07	1.1E-06	**1.7E+03**	**1.7E+02**	**Y**	1.83E-04	**1.7E+03**
TCL Pesticides/PCBs																		
4,4'-DDE	72-55-9	1.21E+01	1.21E+02	0.06	8.0E-02	4.8E-03	2.0E+01	1.2E+00	1.0E+00	6.0E-02	Invertebrate	5.2E+00	5.2E+01	1.2E-02	1.2E-03	N	--	--
alpha-Chlordane	5103-71-9	1.11E-01	1.11E+00	0.062	1.0E+00	6.2E-02	4.0E+00	2.5E-01	1.0E+00	6.2E-02	Invertebrate	2.4E-01	2.4E+00	2.6E-01	2.6E-02	N	--	--
delta-BHC	319-86-8	9.60E-03	9.60E-02	0.006	1.0E+00	6.0E-03	2.6E+00	1.5E-02	1.0E+00	6.0E-03	Invertebrate	3.2E-02	3.2E-01	1.9E-01	1.9E-02	N	--	--
Dieldrin	60-57-1	1.05E-02	1.05E-01	0.011	1.0E+00	1.1E-02	8.0E+01	8.8E-01	1.0E+00	1.1E-02	Invertebrate	1.1E-03	1.1E-02	**9.6E+00**	9.6E-01	**Y**	0.00432	**3.8E+00**
Endrin aldehyde	7421-93-4	2.62E-02	2.62E-01	0.0044	1.0E+00	4.4E-03	3.6E+00	1.6E-02	1.0E+00	4.4E-03	Invertebrate	6.2E-02	6.2E-01	7.1E-02	7.1E-03	N	--	--
Endrin ketone	53494-70-5	2.62E-02	2.62E-01	0.0075	1.0E+00	7.5E-03	3.6E+00	2.7E-02	1.0E+00	7.5E-03	Invertebrate	6.2E-02	6.2E-01	1.2E-01	1.2E-02	N	--	--
gamma-Chlordane	5103-74-2	1.11E-01	1.11E+00	0.055	1.0E+00	5.5E-02	4.0E+00	2.2E-01	1.0E+00	5.5E-02	Invertebrate	2.4E-01	2.4E+00	2.3E-01	2.3E-02	N	--	--
Heptachlor	76-44-8	6.85E-02	6.85E-01	0.0013	1.0E+00	1.3E-03	3.0E+00	3.9E-03	1.0E+00	1.3E-03	Invertebrate	2.0E-01	2.0E+00	6.7E-03	6.7E-04	N	--	--
Heptachlor epoxide	1024-57-3	1.32E-02	1.32E-01	0.021	1.0E+00	2.1E-02	8.4E+00	1.8E-01	1.0E+00	2.1E-02	Invertebrate	1.4E-02	1.4E-01	**1.6E+00**	1.6E-01	**Y**	0.01110	8.2E-01
Methoxychlor	72-43-5	2.11E+00	4.22E+00	0.003	1.0E+00	3.0E-03	2.8E+00	8.3E-03	1.0E+00	3.0E-03	Invertebrate	6.5E+00	1.3E+01	4.6E-04	2.3E-04	N	--	--
Aroclor 1254	11097-69-1	1.94E-02	1.94E-01	2.8	6.8E-03	1.9E-02	1.6E+01	4.5E+01	1.0E+00	2.8E+00	Invertebrate	1.1E-02	1.1E-01	**2.7E+02**	**2.7E+01**	**Y**	0.856	**8.1E+01**
Aroclor 1260	11096-82-5	1.94E-02	1.94E-01	0.38	4.5E-03	1.7E-03	1.6E+01	6.0E+00	1.0E+00	3.8E-01	Invertebrate	1.1E-02	1.1E-01	**3.6E+01**	**3.6E+00**	**Y**	0.358	**3.4E+01**
PAHs																		
Acenaphthene	83-32-9	4.99E+00	2.50E+01	3.5	4.6E+00	1.6E+01	2.2E+00	7.7E+00	1.0E+00	3.5E+00	Plant	9.3E+00	4.7E+01	3.8E-01	7.5E-02	N	--	--
Acenaphthylene	208-96-8	5.27E+01	2.64E+02	0.24	4.6E+00	1.1E+00	1.1E+01	2.6E+00	1.0E+00	2.4E-01	Invertebrate	4.2E+01	2.1E+02	5.8E-03	1.2E-03	N	--	--
Benzo(a)anthracene	56-55-3	8.74E-02	8.74E-01	0.015	5.4E-01	8.1E-03	9.1E-01	1.4E-02	1.0E+00	1.5E-02	Mammal	7.3E-01	7.3E+00	2.0E-02	2.0E-03	N	--	--
Benzo(a)pyrene	50-32-8	2.85E-01	2.85E+00	0.057	3.3E+00	1.9E-01	1.0E+00	5.7E-02	1.0E+00	5.7E-02	Plant	7.4E-01	7.4E+00	7.7E-02	7.7E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	2.85E-01	2.85E+00	0.1	4.8E-01	4.8E-02	1.8E+00	1.8E-01	1.0E+00	1.0E-01	Invertebrate	1.3E+00	1.3E+01	7.6E-02	7.6E-03	N	--	--
Benzo(g,h,i)perylene	191-24-2	1.43E-01	7.13E-01	0.084	1.6E+00	1.3E-01	2.8E+00	2.4E-01	1.0E+00	8.4E-02	Invertebrate	4.3E-01	2.2E+00	2.0E-01	3.9E-02	N	--	--
Benzo(k)fluoranthene	207-08-9	3.15E+00	3.15E+01	0.032	1.0E+00	3.2E-02	1.4E+00	4.6E-02	1.0E+00	3.2E-02	Invertebrate	1.9E+01	1.9E+02	1.7E-03	1.7E-04	N	--	--
Chrysene	218-01-9	4.32E+00	4.32E+01	0.042	1.1E+00	4.4E-02	1.3E+00	5.5E-02	1.0E+00	4.2E-02	Invertebrate	2.8E+01	2.8E+02	1.5E-03	1.5E-04	N	--	--
Dibenz(a,h)anthracene	53-70-3	5.82E-01	5.82E+00	0.0089	2.3E-01	2.0E-03	1.6E+00	1.4E-02	1.0E+00	8.9E-03	Invertebrate	3.1E+00	3.1E+01	2.9E-03	2.9E-04	N	--	--
Fluoranthene	206-44-0	8.74E+00	4.37E+01	0.072	6.0E+00	4.3E-01	3.5E+00	2.5E-01	1.0E+00	7.2E-02	Plant	1.3E+01	6.3E+01	5.8E-03	1.2E-03	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	3.15E+00	3.15E+01	0.035	1.5E-01	5.3E-03	1.8E+00	6.3E-02	1.0E+00	3.5E-02	Invertebrate	1.5E+01	1.5E+02	2.3E-03	2.3E-04	N	--	--
Phenanthrene	85-01-8	2.00E+00	9.98E+00	0.025	1.1E+01	2.8E-01	8.5E-01	2.1E-02	1.0E+00	2.5E-02	Plant	1.6E+00	7.8E+00	1.6E-02	3.2E-03	N	--	--
Pyrene	129-00-0	2.28E+00	1.14E+01	0.065	3.7E+00	2.4E-01	3.0E+00	2.0E-01	1.0E+00	6.5E-02	Plant	5.3E+00	2.6E+01	1.2E-02	2.5E-03	N	--	--
Explosives																		
1,3,5-Trinitrobenzene	99-35-4	1.39E+00	6.89E+00	1.9	8.5E+00	1.6E+01	1.0E+00	1.9E+00	1.0E+00	1.9E+00	Plant	1.4E+00	7.0E+00	**1.3E+00**	2.7E-01	**Y**	1.90	**1.3E+00**
2,4,6-Trinitrotoluene	118-96-7	2.65E+00	1.06E+01	80	8.5E+00	6.8E+02	1.0E+00	8.0E+01	1.0E+00	8.0E+01	Plant	2.7E+00	1.1E+01	**3.0E+01**	**7.4E+00**	**Y**	20.26	**7.5E+00**
2,4-Dinitrotoluene	121-14-2	NV	NV	11	8.5E+00	9.3E+01	1.0E+00	1.1E+01	1.0E+00	1.1E+01	Plant	--	--	**--**	**--**	--	--	--
2-Amino-4,6-Dinitrotoluene	355-72-78-2	4.66E+00	2.48E+01	9.6	8.5E+00	8.1E+01	1.0E+00	9.6E+00	1.0E+00	9.6E+00	Plant	4.7E+00	2.5E+01	**2.0E+00**	3.8E-01	**Y**	1.61	3.4E-01
4-Amino-2,6-Dinitrotoluene	1946-51-0	4.66E+00	2.48E+01	14	8.5E+00	1.2E+02	1.0E+00	1.4E+01	1.0E+00	1.4E+01	Plant	4.7E+00	2.5E+01	**3.0E+00**	5.5E-01	**Y**	2.32	4.9E-01
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	4.14E+00	2.06E+01	8.2	5.3E+00	4.3E+01	1.0E+00	8.2E+00	1.0E+00	8.2E+00	Plant	6.8E+00	3.4E+01	**1.2E+00**	2.4E-01	**Y**	1.51	2.2E-01
Nitroglycerin																		
Nitroglycerin	55-63-0	1.55E+00	1.66E+01	400	1.0E+00	4.0E+02	1.0E+00	4.0E+02	1.0E+00	4.0E+02	Mammal	1.3E+01	1.4E+02	**3.1E+01**	**2.9E+00**	**Y**	400	**3.1E+01**

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10
BW = Minimum Body Weigth of Receptor (kg)
IR_{food} = Maximum Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)
DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = 100% Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

Red Fox Specific Data from Table F.3-9

BW=	2.9500	kg
IR_{food} =	0.342	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00960	kg dw/day
IR_{water} =	0.573	L/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Screening Level
LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Screening Level
EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.3-19
Refined Wildlife Risk Characterization - Red Fox
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment										
				Soil										
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics														
Arsenic	7440-38-2	3.59E-02	3.59E-01	2.08	3.8E-02	7.8E-02	1.9E-01	4.0E-01	6.9E-03	1.4E-02	2.0E+03	2.0E+04	1.0E-03	1.0E-04
Cadmium	7440-43-9	5.07E-01	5.07E+00	0.181	1.4E+00	2.4E-01	1.2E+01	2.1E+00	7.0E-01	1.3E-01	1.1E+03	1.1E+04	1.7E-04	1.7E-05
Chromium	7440-47-3	1.73E+00	1.73E+01	25	4.1E-02	1.0E+00	3.1E-01	7.7E+00	9.9E-02	2.5E+00	3.8E+04	3.8E+05	6.7E-04	6.7E-05
Copper	7440-50-8	8.02E+00	1.06E+01	58.8	1.7E-01	9.7E+00	5.2E-01	3.0E+01	2.4E-01	1.4E+01	8.3E+04	1.1E+05	7.1E-04	5.4E-04
Lead	7439-92-1	4.22E+00	4.22E+01	2,581	8.4E-03	2.2E+01	1.8E-01	4.6E+02	1.3E-02	3.5E+01	2.4E+05	2.4E+06	1.1E-02	1.1E-03
Selenium	7782-49-2	1.05E-01	1.74E-01	1.53	5.3E-01	8.1E-01	8.3E-01	1.3E+00	5.1E-01	7.7E-01	5.2E+02	8.6E+02	2.9E-03	1.8E-03
Zinc	7440-66-6	8.44E+01	1.69E+02	272	4.0E-01	1.1E+02	2.0E+00	5.4E+02	4.3E-01	1.2E+02	4.5E+05	8.9E+05	6.1E-04	3.0E-04
Dioxin/Furans														
Total 2,3,7,8-TCDD Equivalents	1746-01-6	2.85E-07	2.85E-06	1.83E-04	6.5E-03	1.2E-06	1.1E+01	2.0E-03	9.4E-01	1.7E-04	6.4E-04	6.4E-03	2.9E-01	2.9E-02
TCL Pesticides/PCBs														
Dieldrin	60-57-1	1.05E-02	1.05E-01	0.00432	4.1E-01	1.8E-03	1.7E+01	7.2E-02	5.0E-04	2.2E-06	3.8E+01	3.8E+02	1.1E-04	1.1E-05
Heptachlor epoxide	1024-57-3	1.32E-02	1.32E-01	0.0111	5.0E-02	5.5E-04	8.4E+00	9.3E-02	1.0E+00	1.1E-02	3.1E+01	3.1E+02	3.6E-04	3.6E-05
Aroclor 1254	11097-69-1	1.94E-02	1.94E-01	0.856	6.8E-03	5.8E-03	6.7E+00	5.7E+00	1.0E+00	8.6E-01	4.9E+01	4.9E+02	1.8E-02	1.8E-03
Aroclor 1260	11096-82-5	1.94E-02	1.94E-01	0.358	4.5E-03	1.6E-03	6.7E+00	2.4E+00	1.0E+00	3.6E-01	4.9E+01	4.9E+02	7.4E-03	7.4E-04
Explosives														
1,3,5-Trinitrobenzene	99-35-4	1.39E+00	6.89E+00	1.90	4.2E+00	8.0E+00	1.0E+00	1.9E+00	0.0E+00	0.0E+00	4.8E+03	2.4E+04	4.0E-04	8.0E-05
2,4,6-Trinitrotoluene	118-96-7	2.65E+00	1.06E+01	20.26	4.2E+00	8.6E+01	1.0E+00	2.0E+01	0.0E+00	0.0E+00	9.2E+03	3.7E+04	2.2E-03	5.5E-04
2-Amino-4,6-Dinitrotoluene	355-72-78-2	4.66E+00	2.48E+01	1.61	4.2E+00	6.8E+00	1.0E+00	1.6E+00	0.0E+00	0.0E+00	1.6E+04	8.6E+04	1.0E-04	1.9E-05
4-Amino-2,6-Dinitrotoluene	1946-51-0	4.66E+00	2.48E+01	2.32	4.2E+00	9.8E+00	1.0E+00	2.3E+00	0.0E+00	0.0E+00	1.6E+04	8.6E+04	1.4E-04	2.7E-05
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	4.14E+00	2.06E+01	1.51	4.3E-01	6.5E-01	1.0E+00	1.5E+00	0.0E+00	0.0E+00	8.0E+04	4.0E+05	1.9E-05	3.8E-06
Nitroglycerin														
Nitroglycerin	55-63-0	1.55E+00	1.66E+01	400	1.0E+00	4.0E+02	1.0E+00	4.0E+02	0.0E+00	0.0E+00	1.8E+04	1.9E+05	2.3E-02	2.1E-03

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-9
BW = Average Body Weigth of Receptor (kg)
IR_{food} = Average Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor, specific to prey type and chemical
DF = Dietary fraction
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

Red FoxSpecific Data from Table F.3-10

BW=	4.5300	kg
IR_{food} =	0.238	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.17	unitless
DF_{inv} =	0.04	unitless
DF_{mam} =	0.79	unitless
IR_{soil} =	0.00670	kg dw/day
IR_{water} =	0.386	L/day
AF =	0.0070	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level
LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.3-20
Preliminary Wildlife Risk Characterization - American Robin
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment												
				Soil												
				Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																
Arsenic	7440-38-2	5.14E+00	1.28E+01	5.1	1.1E+00	5.6E+00	5.2E-01	2.7E+00	Plant	1.4E+01	3.5E+01	3.6E-01	1.4E-01	N	--	--
Cadmium	7440-43-9	1.45E+00	2.00E+01	0.64	3.3E+00	2.1E+00	4.1E+01	2.6E+01	Invertebrate	1.1E-01	1.6E+00	**5.7E+00**	4.1E-01	**Y**	0.181	**1.6E+00**
Chromium	7440-47-3	1.00E+00	5.00E+00	41.6	8.4E-02	3.5E+00	3.2E+00	1.3E+02	Invertebrate	9.9E-01	4.9E+00	**4.2E+01**	**8.4E+00**	**Y**	25	**2.5E+01**
Copper	7440-50-8	4.70E+01	6.17E+01	195	6.3E-01	1.2E+02	1.5E+00	3.0E+02	Invertebrate	9.4E+01	1.2E+02	**2.1E+00**	**1.6E+00**	**Y**	58.8	6.2E-01
Lead	7439-92-1	1.13E+00	1.13E+01	3,610	4.7E-01	1.7E+03	1.5E+00	5.5E+03	Invertebrate	2.3E+00	2.3E+01	**1.6E+03**	**1.6E+02**	**Y**	2,581	**1.1E+03**
Mercury	7439-97-6	4.50E-01	9.00E-01	0.77	5.0E+00	3.9E+00	2.1E+01	1.6E+01	Invertebrate	6.9E-02	1.4E-01	**1.1E+01**	**5.6E+00**	**Y**	0.29	**4.2E+00**
Nickel	7440-02-0	7.74E+01	1.07E+02	19.3	1.4E+00	2.7E+01	4.7E+00	9.1E+01	Invertebrate	5.1E+01	7.1E+01	3.8E-01	2.7E-01	N	--	--
Selenium	7782-49-2	4.00E-01	8.00E-01	2.6	3.0E+00	7.8E+00	1.3E+00	3.5E+00	Plant	4.1E-01	8.3E-01	**6.3E+00**	**3.1E+00**	**Y**	1.53	**3.7E+00**
Silver	7440-22-4	1.66E+01	1.24E+02	0.11	3.7E-02	4.1E-03	1.5E+01	1.7E+00	Invertebrate	3.4E+00	2.6E+01	3.2E-02	4.3E-03	N	--	--
Zinc	7440-66-6	1.45E+01	1.31E+02	555	1.8E+00	1.0E+03	1.3E+01	7.2E+03	Invertebrate	3.6E+00	3.2E+01	**1.6E+02**	**1.7E+01**	**Y**	272	**7.6E+01**
Dioxin/Furans																
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	3.22E-04	7.5E-03	2.4E-06	2.2E+01	7.1E-03	Invertebrate	2.0E-06	2.0E-05	**1.6E+02**	**1.6E+01**	**Y**	2.68E-04	**1.3E+02**
TCL Pesticides/PCBs																
4,4'-DDE	72-55-9	5.80E-02	5.80E-01	0.06	8.0E-02	4.8E-03	2.0E+01	1.2E+00	Invertebrate	9.1E-03	9.1E-02	**6.6E+00**	6.6E-01	**Y**	0.06	**6.6E+00**
alpha-Chlordane	5103-71-9	2.14E+00	1.07E+01	0.062	1.0E+00	6.2E-02	4.0E+00	2.5E-01	Invertebrate	1.7E+00	8.4E+00	3.7E-02	7.4E-03	N	--	--
delta-BHC	319-86-8	5.60E-01	2.25E+00	0.006	1.0E+00	6.0E-03	2.6E+00	1.5E-02	Invertebrate	6.8E-01	2.7E+00	8.9E-03	2.2E-03	N	--	--
Dieldrin	60-57-1	7.70E-02	7.70E-01	0.011	1.0E+00	1.1E-02	8.0E+01	8.8E-01	Invertebrate	3.1E-03	3.1E-02	**3.6E+00**	3.6E-01	**Y**	0.00432	**1.4E+00**
Endrin aldehyde	7421-93-4	2.80E-02	1.70E-01	0.0044	1.0E+00	4.4E-03	3.6E+00	1.6E-02	Invertebrate	2.4E-02	1.5E-01	1.8E-01	3.0E-02	N	--	--
Endrin ketone	53494-70-5	2.80E-02	1.70E-01	0.0075	1.0E+00	7.5E-03	3.6E+00	2.7E-02	Invertebrate	2.4E-02	1.5E-01	3.1E-01	5.1E-02	N	--	--
gamma-Chlordane	5103-74-2	2.14E+00	1.06E+01	0.055	1.0E+00	5.5E-02	4.0E+00	2.2E-01	Invertebrate	1.7E+00	8.3E+00	3.3E-02	6.6E-03	N	--	--
Heptachlor	76-44-8	2.50E+00	1.25E+01	0.0013	1.0E+00	1.3E-03	3.0E+00	3.9E-03	Invertebrate	2.6E+00	1.3E+01	5.0E-04	1.0E-04	N	--	--
Heptachlor epoxide	1024-57-3	9.90E-01	4.95E+00	0.021	1.0E+00	2.1E-02	8.4E+00	1.8E-01	Invertebrate	3.7E-01	1.9E+00	5.6E-02	1.1E-02	N	--	--
Methoxychlor	72-43-5	1.45E+01	1.45E+02	0.003	1.0E+00	3.0E-03	2.8E+00	8.3E-03	Invertebrate	1.6E+01	1.6E+02	1.8E-04	1.8E-05	N	--	--
Aroclor 1254	11097-69-1	4.10E-01	4.10E+00	2.8	6.8E-03	1.9E-02	1.6E+01	4.5E+01	Invertebrate	8.2E-02	8.2E-01	**3.4E+01**	**3.4E+00**	**Y**	0.856	**1.0E+01**
Aroclor 1260	11096-82-5	4.10E-01	4.10E+00	0.38	4.5E-03	1.7E-03	1.6E+01	6.0E+00	Invertebrate	8.2E-02	8.2E-01	**4.7E+00**	4.7E-01	**Y**	0.358	**4.4E+00**
PAHs																
Acenaphthene	83-32-9	1.01E+00	5.05E+00	3.5	4.6E+00	1.6E+01	2.2E+00	7.7E+00	Plant	6.9E-01	3.4E+00	**5.1E+00**	**1.0E+00**	**Y**	1.09	**1.6E+00**
Acenaphthylene	208-96-8	NV	NV	0.24	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	56-55-3	NV	NV	0.015	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	5.00E-01	2.50E+00	0.057	3.3E+00	1.9E-01	1.0E+00	5.7E-02	Plant	4.7E-01	2.4E+00	1.2E-01	2.4E-02	N	--	--
Benzo(b)fluoranthene	205-99-2	NV	NV	0.1	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	191-24-2	NV	NV	0.084	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	207-08-9	NV	NV	0.032	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	218-01-9	NV	NV	0.042	--	--	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	53-70-3	NV	NV	0.0089	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	NV	NV	0.072	--	--	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	NV	NV	0.035	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.025	1.1E+01	2.8E-01	8.5E-01	2.1E-02	Plant	3.2E-01	1.6E+00	7.7E-02	1.5E-02	N	--	--
Pyrene	129-00-0	NV	NV	0.065	--	--	--	--	--	--	--	--	--	--	--	--
Explosives																
1,3,5-Trinitrobenzene	99-35-4	NV	NV	1.9	--	--	--	--	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	80	8.5E+00	6.8E+02	1.0E+00	8.0E+01	Plant	2.6E-02	6.7E-01	**3.1E+03**	**1.2E+02**	**Y**	20.26	**7.8E+02**
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	11	8.5E+00	9.3E+01	1.0E+00	1.1E+01	Plant	3.7E-02	4.7E-01	**2.9E+02**	**2.4E+01**	**Y**	9.533	**2.6E+02**
2-Amino-4,6-Dinitrotoluene	355-72-78-2	NV	NV	9.6	--	--	--	--	--	--	--	--	--	--	--	--
4-Amino-2,6-Dinitrotoluene	1946-51-0	NV	NV	14	--	--	--	--	--	--	--	--	--	--	--	--
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	2.60E+00	2.60E+01	8.2	5.3E+00	4.3E+01	1.0E+00	8.2E+00	Plant	1.6E+00	1.6E+01	**5.3E+00**	5.3E-01	**Y**	1.51	9.7E-01
Nitroglycerin																
Nitroglycerin	55-63-0	NV	NV	400	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10
BW = Minimum Body Weigth of Receptor (kg)
IR_{food} = Maximum Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)
DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = 100% Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

American Robin Specific Data from Table F.3-9

BW=	0.0635	kg
IR_{food} =	0.020	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00100	kg dw/day
IR_{water} =	0.013	L/day
AF =	1	unitless

[a] = The following equation was used to calculate screening level:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration
LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration
EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.3-21
Refined Wildlife Risk Characterization - American Robin
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment								
				Soil								
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics												
Cadmium	7440-43-9	1.45E+00	2.00E+01	0.181	1.4E+00	2.4E-01	1.2E+01	2.1E+00	1.3E+00	1.8E+01	1.4E-01	1.0E-02
Chromium	7440-47-3	1.00E+00	5.00E+00	25	4.1E-02	1.0E+00	3.1E-01	7.7E+00	2.5E+01	1.3E+02	9.9E-01	2.0E-01
Copper	7440-50-8	4.70E+01	6.17E+01	58.8	1.7E-01	9.7E+00	5.2E-01	3.0E+01	6.5E+02	8.6E+02	9.0E-02	6.9E-02
Lead	7439-92-1	1.13E+00	1.13E+01	2,581	8.4E-03	2.2E+01	1.8E-01	4.6E+02	4.5E+01	4.5E+02	**5.8E+01**	**5.8E+00**
Mercury	7439-97-6	4.50E-01	9.00E-01	0.29	6.5E-01	1.9E-01	1.7E+00	4.9E-01	2.0E+00	4.0E+00	1.5E-01	7.3E-02
Selenium	7782-49-2	4.00E-01	8.00E-01	1.53	5.3E-01	8.1E-01	8.3E-01	1.3E+00	2.8E+00	5.6E+00	5.5E-01	2.7E-01
Zinc	7440-66-6	1.45E+01	1.31E+02	272	4.0E-01	1.1E+02	2.0E+00	5.4E+02	6.7E+01	6.0E+02	**4.1E+00**	4.5E-01
Dioxin/Furans												
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	2.68E-04	6.5E-03	1.7E-06	1.1E+01	2.9E-03	1.6E-05	1.6E-04	**1.7E+01**	**1.7E+00**
TCL Pesticides/PCBs					--	--	--					
4,4'-DDE	72-55-9	5.80E-02	5.80E-01	0.06	1.6E-01	9.8E-03	1.7E+01	1.0E+00	4.3E-02	4.3E-01	**1.4E+00**	1.4E-01
Dieldrin	60-57-1	7.70E-02	7.70E-01	0.00432	4.1E-01	1.8E-03	1.7E+01	7.2E-02	5.6E-02	5.6E-01	7.7E-02	7.7E-03
Aroclor 1254	11097-69-1	4.10E-01	4.10E+00	0.856	6.8E-03	5.8E-03	6.7E+00	5.7E+00	7.7E-01	7.7E+00	1.1E+00	1.1E-01
Aroclor 1260	11096-82-5	4.10E-01	4.10E+00	0.358	4.5E-03	1.6E-03	6.7E+00	2.4E+00	7.7E-01	7.7E+00	4.7E-01	4.7E-02
PAHs												
Acenaphthene	83-32-9	1.01E+00	5.05E+00	1.09	3.3E-03	3.6E-03	7.0E-01	7.7E-01	1.5E+01	7.6E+01	7.1E-02	1.4E-02
Explosives												
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	20.26	4.2E+00	8.6E+01	1.0E+00	2.0E+01	1.1E-01	2.8E+00	**1.8E+02**	**7.1E+00**
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	9.53	4.2E+00	4.0E+01	1.0E+00	9.5E+00	1.6E-01	2.0E+00	**6.0E+01**	**4.8E+00**
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tri	121-82-4	2.60E+00	2.60E+01	1.51	4.3E-01	6.5E-01	1.0E+00	1.5E+00	1.8E+01	1.8E+02	8.4E-02	8.4E-03

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

American Robin Specific Data from Table F.3-9

BW=	0.0773	kg
IR_{food} =	0.016	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.62	unitless
DF_{inv} =	0.38	unitless
IR_{soil} =	0.0008	kg dw/day
IR_{water} =	0.011	L/day
AF =	1.000	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.3-22
Preliminary Wildlife Risk Characterization - Red-tailed Hawk
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment									
				Soil									
				Maximum Detected Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics													
Arsenic	7440-38-2	5.14E+00	1.28E+01	5.1	1.5E-02	7.6E-02	5.2E+03	1.3E+04	9.7E-04	3.9E-04	N	--	--
Cadmium	7440-43-9	1.45E+00	2.00E+01	0.64	4.0E+00	2.6E+00	5.5E+00	7.6E+01	1.2E-01	8.4E-03	N	--	--
Chromium	7440-47-3	1.00E+00	5.00E+00	41.6	3.3E-01	1.4E+01	4.6E+01	2.3E+02	9.1E-01	1.8E-01	N	--	--
Copper	7440-50-8	4.70E+01	6.17E+01	195	1.0E+00	2.0E+02	6.8E+02	9.0E+02	2.9E-01	2.2E-01	N	--	--
Lead	7439-92-1	1.13E+00	1.13E+01	3,610	2.9E-01	1.0E+03	6.0E+01	6.0E+02	**6.0E+01**	**6.0E+00**	**Y**	2,581	**4.3E+01**
Mercury	7439-97-6	4.50E-01	9.00E-01	0.77	1.9E-01	1.5E-01	3.6E+01	7.1E+01	2.2E-02	1.1E-02	N	--	--
Nickel	7440-02-0	7.74E+01	1.07E+02	19.3	5.9E-01	1.1E+01	2.0E+03	2.8E+03	9.7E-03	7.0E-03	N	--	--
Selenium	7782-49-2	4.00E-01	8.00E-01	2.6	1.2E+00	3.1E+00	5.1E+00	1.0E+01	5.1E-01	2.5E-01	N	--	--
Silver	7440-22-4	1.66E+01	1.24E+02	0.11	5.0E-01	5.5E-02	5.0E+02	3.8E+03	2.2E-04	2.9E-05	N	--	--
Zinc	7440-66-6	1.45E+01	1.31E+02	555	2.7E+00	1.5E+03	8.2E+01	7.4E+02	**6.8E+00**	7.5E-01	**Y**	272	**3.3E+00**
Dioxin/Furans													
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	3.22E-04	2.2E+00	7.1E-04	9.7E-05	9.7E-04	**3.3E+00**	3.3E-01	**Y**	2.68E-04	**2.8E+00**
TCL Pesticides/PCBs													
4,4'-DDE	72-55-9	5.80E-02	5.80E-01	0.06	1.0E+00	6.0E-02	8.8E-01	8.8E+00	6.8E-02	6.8E-03	N	--	--
alpha-Chlordane	5103-71-9	2.14E+00	1.07E+01	0.062	1.0E+00	6.2E-02	3.3E+01	1.6E+02	1.9E-03	3.8E-04	N	--	--
delta-BHC	319-86-8	5.60E-01	2.25E+00	0.006	1.0E+00	6.0E-03	8.5E+00	3.4E+01	7.1E-04	1.8E-04	N	--	--
Dieldrin	60-57-1	7.70E-02	7.70E-01	0.011	1.0E+00	1.1E-02	1.2E+00	1.2E+01	9.4E-03	9.4E-04	N	--	--
Endrin aldehyde	7421-93-4	2.80E-02	1.70E-01	0.0044	1.0E+00	4.4E-03	4.3E-01	2.6E+00	1.0E-02	1.7E-03	N	--	--
Endrin ketone	53494-70-5	2.80E-02	1.70E-01	0.0075	1.0E+00	7.5E-03	4.3E-01	2.6E+00	1.8E-02	2.9E-03	N	--	--
gamma-Chlordane	5103-74-2	2.14E+00	1.06E+01	0.055	1.0E+00	5.5E-02	3.3E+01	1.6E+02	1.7E-03	3.4E-04	N	--	--
Heptachlor	76-44-8	2.50E+00	1.25E+01	0.0013	1.0E+00	1.3E-03	3.8E+01	1.9E+02	3.4E-05	6.8E-06	N	--	--
Heptachlor epoxide	1024-57-3	9.90E-01	4.95E+00	0.021	1.0E+00	2.1E-02	1.5E+01	7.5E+01	1.4E-03	2.8E-04	N	--	--
Methoxychlor	72-43-5	1.45E+01	1.45E+02	0.003	1.0E+00	3.0E-03	2.2E+02	2.2E+03	1.4E-05	1.4E-06	N	--	--
Aroclor 1254	11097-69-1	4.10E-01	4.10E+00	2.8	1.0E+00	2.8E+00	6.2E+00	6.2E+01	4.5E-01	4.5E-02	N	--	--
Aroclor 1260	11096-82-5	4.10E-01	4.10E+00	0.38	1.0E+00	3.8E-01	6.2E+00	6.2E+01	6.1E-02	6.1E-03	N	--	--
PAHs													
Acenaphthene	83-32-9	1.01E+00	5.05E+00	3.5	1.0E+00	3.5E+00	1.5E+01	7.7E+01	2.3E-01	4.6E-02	N	--	--
Acenaphthylene	208-96-8	NV	NV	0.24	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	56-55-3	NV	NV	0.015	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	5.00E-01	2.50E+00	0.057	1.0E+00	5.7E-02	7.6E+00	3.8E+01	7.5E-03	1.5E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	NV	NV	0.1	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	191-24-2	NV	NV	0.084	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	207-08-9	NV	NV	0.032	--	--	--	--	--	--	--	--	--
Chrysene	218-01-9	NV	NV	0.042	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	53-70-3	NV	NV	0.0089	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	NV	NV	0.072	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	NV	NV	0.035	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.025	1.0E+00	2.5E-02	1.7E+01	8.6E+01	1.5E-03	2.9E-04	N	--	--
Pyrene	129-00-0	NV	NV	0.065	--	--	--	--	--	--	--	--	--
Explosives													
1,3,5-Trinitrobenzene	99-35-4	NV	NV	1.9	--	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	80	1.0E+00	8.0E+01	1.1E+00	2.7E+01	**7.5E+01**	**2.9E+00**	**Y**	20.26	**1.9E+01**
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	11	1.0E+00	1.1E+01	1.5E+00	1.9E+01	**7.2E+00**	5.8E-01	**Y**	9.53	**6.3E+00**
2-Amino-4,6-Dinitrotoluene	355-72-78-2	NV	NV	9.6	--	--	--	--	--	--	--	--	--
4-Amino-2,6-Dinitrotoluene	1946-51-0	NV	NV	14	--	--	--	--	--	--	--	--	--
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	2.60E+00	2.60E+01	8.2	1.0E+00	8.2E+00	3.9E+01	3.9E+02	2.1E-01	2.1E-02	N	--	--
Nitroglycerin													
Nitroglycerin	55-63-0	NV	NV	400	--	--	--	--	--	--	--	--	--

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10
BW_r = Minimum Body Weigth of Receptor (kg)
IR_{food} = Maximum Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)
DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = 100% Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
ECP = Exposure Point Concentration

Red-tailed Hawk Specific Data from Table F.3-9
Red-tailed Hawk

BW=	0.957	kg
IR_{food} =	0.063	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00	kg dw/day
IR_{water} =	0.068	L/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration
LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration
EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.3-23
Refined Wildlife Risk Characterization - Red-tailed Hawk
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment						
				Soil						
				EPC (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Soil Screening Level[a] (mg/kg)	Calculated LOAEL-Based Soil Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics										
Lead	7439-92-1	1.13E+00	1.13E+01	2,581	1.3E-02	3.5E+01	6.0E+05	6.0E+06	4.3E-03	4.3E-04
Zinc	7440-66-6	1.45E+01	1.31E+02	272	4.3E-01	1.2E+02	2.4E+05	2.2E+06	1.1E-03	1.2E-04
Dioxin/Furans										
Total 2,3,7,8-TCDD Equivalents	1746-01-6	1.40E-05	1.40E-04	2.68E-04	9.4E-01	2.5E-04	1.1E-01	1.1E+00	2.5E-03	2.5E-04
Explosives										
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	20.26	0.0E+00	0.0E+00	--	--	--	--
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	9.53	0.0E+00	0.0E+00	--	--	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.3-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Red-tailed Hawk Specific Data from Table F.3-9

BW=	1.134	kg
IR_{food} =	0.059	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{mam} =	1.00	unitless
IR_{soil} =	0.0	kg dw/day
IR_{water} =	0.064	L/day
AF =	0.0027	unitless

Table F.3-24
Terrestrial Wildlife Summary
Screening Level Ecological Risk Assessment - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS#	Meadow Vole					Short-tailed Shrew					Red Fox					American Robin					Red-tailed Hawk				
		Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ
Inorganics																										
Arsenic	7440-38-2	**2.8E+01**	**2.8E+00**	**1.2E+01**	2.3E-01	2.3E-02	**1.0E+01**	**1.0E+00**	**4.1E+00**	5.6E-01	5.6E-02	**1.9E+01**	**1.9E+00**	**7.6E+00**	1.0E-03	1.0E-04	3.6E-01	1.4E-01	NC	NC	NC	9.7E-04	3.9E-04	NC	NC	NC
Cadmium	7440-43-9	7.3E-01	7.3E-02	NC	NC	NC	**3.0E+00**	3.0E-01	8.4E-01	1.2E-01	1.2E-02	**6.0E+00**	6.0E-01	**1.7E+00**	1.7E-04	1.7E-05	**5.7E+00**	4.1E-01	**1.6E+00**	1.4E-01	1.0E-02	1.2E-01	8.4E-03	NC	NC	NC
Chromium	7440-47-3	4.6E-01	4.6E-02	NC	NC	NC	**4.6E+00**	4.6E-01	**2.7E+00**	1.8E-01	1.8E-02	**8.9E+00**	8.9E-01	**5.3E+00**	6.7E-04	6.7E-05	**4.2E+01**	**8.4E+00**	**2.5E+01**	9.9E-01	2.0E-01	9.1E-01	1.8E-01	NC	NC	NC
Copper	7440-50-8	**2.8E+00**	**2.1E+00**	8.4E-01	9.0E-02	6.8E-02	**2.3E+00**	**1.8E+00**	7.0E-01	1.4E-01	1.1E-01	**4.4E+00**	**3.3E+00**	**1.3E+00**	7.1E-04	5.4E-04	**2.1E+00**	**1.6E+00**	6.2E-01	9.0E-02	6.9E-02	2.9E-01	2.2E-01	NC	NC	NC
Lead	7439-92-1	**7.4E+01**	**7.4E+00**	**5.3E+01**	**1.3E+00**	1.3E-01	**8.1E+01**	**8.1E+00**	**5.8E+01**	**5.5E+00**	5.5E-01	**1.5E+02**	**1.5E+01**	**1.1E+02**	1.1E-02	1.1E-03	**1.6E+03**	**1.6E+02**	**1.1E+03**	**5.8E+01**	**5.8E+00**	**6.0E+01**	**6.0E+00**	**4.3E+01**	4.3E-03	4.3E-04
Mercury	7439-97-6	7.6E-02	7.6E-03	NC	NC	NC	1.0E-01	1.0E-02	NC	NC	NC	2.0E-01	2.0E-02	NC	NC	NC	**1.1E+01**	**5.6E+00**	**4.2E+00**	1.5E-01	7.3E-02	2.2E-02	1.1E-02	NC	NC	NC
Nickel	7440-02-0	2.3E-01	1.2E-01	NC	NC	NC	2.6E-01	1.3E-01	NC	NC	NC	5.0E-01	2.5E-01	NC	NC	NC	3.8E-01	2.7E-01	NC	NC	NC	9.7E-03	7.0E-03	NC	NC	NC
Selenium	7782-49-2	**1.3E+01**	**8.0E+00**	**7.8E+00**	5.2E-01	3.2E-01	**4.5E+00**	**2.7E+00**	**2.6E+00**	4.3E-01	2.6E-01	**8.7E+00**	**5.3E+00**	**5.1E+00**	2.9E-03	1.8E-03	**6.3E+00**	**3.1E+00**	**3.7E+00**	5.5E-01	2.7E-01	5.1E-01	2.5E-01	NC	NC	NC
Silver	7440-22-4	1.0E-04	1.0E-05	NC	NC	NC	8.3E-03	8.3E-04	NC	NC	NC	1.7E-02	1.7E-03	NC	NC	NC	3.2E-02	4.3E-03	NC	NC	NC	2.2E-04	2.9E-05	NC	NC	NC
Zinc	7440-66-6	**2.1E+00**	**1.1E+00**	**1.1E+00**	8.8E-02	4.4E-02	**4.9E+00**	**2.5E+00**	**2.4E+00**	1.9E-01	9.7E-02	**9.8E+00**	**4.9E+00**	**4.8E+00**	6.1E-04	3.0E-04	**1.6E+02**	**1.7E+01**	**7.6E+01**	**4.1E+00**	4.5E-01	**6.8E+00**	7.5E-01	**3.3E+00**	1.1E-03	1.2E-04
Dioxin/Furans																										
Total 2,3,7,8-TCDD Equivalents	1746-01-6	**3.6E+00**	3.6E-01	**3.6E+00**	**1.3E+00**	1.3E-01	**8.3E+02**	**8.3E+01**	**8.3E+02**	**2.0E+02**	**2.0E+01**	**1.7E+03**	**1.7E+02**	**1.7E+03**	2.9E-01	2.9E-02	**1.6E+02**	**1.6E+01**	**1.3E+02**	**1.7E+01**	**1.7E+00**	**3.3E+00**	3.3E-01	**2.8E+00**	2.5E-03	2.5E-04
TCL Pesticides/PCBs																									NC	NC
4,4'-DDE	72-55-9	9.1E-05	9.1E-06	NC	NC	NC	5.8E-03	5.8E-04	NC	NC	NC	1.2E-02	1.2E-03	NC	NC	NC	**6.6E+00**	6.6E-01	**6.6E+00**	**1.4E+00**	1.4E-01	6.8E-02	6.8E-03	NC	NC	NC
alpha-Chlordane	5103-71-9	1.0E-01	1.0E-02	NC	NC	NC	1.3E-01	1.3E-02	NC	NC	NC	2.6E-01	2.6E-02	NC	NC	NC	3.7E-02	7.4E-03	NC	NC	NC	1.9E-03	3.8E-04	NC	NC	NC
delta-BHC	319-86-8	1.1E-01	1.1E-02	NC	NC	NC	9.7E-02	9.7E-03	NC	NC	NC	1.9E-01	1.9E-02	NC	NC	NC	8.9E-03	2.2E-03	NC	NC	NC	7.1E-04	1.8E-04	NC	NC	NC
Dieldrin	60-57-1	1.9E-01	1.9E-02	NC	NC	NC	**4.8E+00**	4.8E-01	**1.9E+00**	1.9E-01	1.9E-02	**9.6E+00**	9.6E-01	**3.8E+00**	1.1E-04	1.1E-05	**3.6E+00**	3.6E-01	**1.4E+00**	7.7E-02	7.7E-03	9.4E-03	9.4E-04	NC	NC	NC
Endrin aldehyde	7421-93-4	3.0E-02	3.0E-03	NC	NC	NC	3.6E-02	3.6E-03	NC	NC	NC	7.1E-02	7.1E-03	NC	NC	NC	1.8E-01	3.0E-02	NC	NC	NC	1.0E-02	1.7E-03	NC	NC	NC
Endrin ketone	53494-70-5	5.2E-02	5.2E-03	NC	NC	NC	6.1E-02	6.1E-03	NC	NC	NC	1.2E-01	1.2E-02	NC	NC	NC	3.1E-01	5.1E-02	NC	NC	NC	1.8E-02	2.9E-03	NC	NC	NC
gamma-Chlordane	5103-74-2	9.0E-02	9.0E-03	NC	NC	NC	1.2E-01	1.2E-02	NC	NC	NC	2.3E-01	2.3E-02	NC	NC	NC	3.3E-02	6.6E-03	NC	NC	NC	1.7E-03	3.4E-04	NC	NC	NC
Heptachlor	76-44-8	3.4E-03	3.4E-04	NC	NC	NC	3.4E-03	3.4E-04	NC	NC	NC	6.7E-03	6.7E-04	NC	NC	NC	5.0E-04	1.0E-04	NC	NC	NC	3.4E-05	6.8E-06	NC	NC	NC
Heptachlor epoxide	1024-57-3	2.9E-01	2.9E-02	NC	NC	NC	7.8E-01	7.8E-02	NC	NC	NC	**1.6E+00**	1.6E-01	8.2E-01	3.6E-04	3.6E-05	5.6E-02	1.1E-02	NC	NC	NC	1.4E-03	2.8E-04	NC	NC	NC
Methoxychlor	72-43-5	2.6E-04	1.3E-04	NC	NC	NC	2.4E-04	1.2E-04	NC	NC	NC	4.6E-04	2.3E-04	NC	NC	NC	1.8E-04	1.8E-05	NC	NC	NC	1.4E-05	1.4E-06	NC	NC	NC
Aroclor 1254	11097-69-1	7.9E-01	7.9E-02	NC	NC	NC	**1.3E+02**	**1.3E+01**	**4.1E+01**	**8.3E+00**	8.3E-01	**2.7E+02**	**2.7E+01**	**8.1E+01**	1.8E-02	1.8E-03	**3.4E+01**	**3.4E+00**	**1.0E+01**	1.1E+00	1.1E-01	4.5E-01	4.5E-02	NC	NC	NC
Aroclor 1260	11096-82-5	9.9E-02	9.9E-03	NC	NC	NC	**1.8E+01**	**1.8E+00**	**1.7E+01**	**3.5E+00**	3.5E-01	**3.6E+01**	**3.6E+00**	**3.4E+01**	7.4E-03	7.4E-04	**4.7E+00**	4.7E-01	**4.4E+00**	4.7E-01	4.7E-02	6.1E-02	6.1E-03	NC	NC	NC
PAHs																										
Acenaphthene	83-32-9	5.7E-01	1.1E-01	NC	NC	NC	1.9E-01	3.8E-02	NC	NC	NC	3.8E-01	7.5E-02	NC	NC	NC	**5.1E+00**	**1.0E+00**	**1.6E+00**	7.1E-02	1.4E-02	2.3E-01	4.6E-02	NC	NC	NC
Acenaphthylene	208-96-8	3.7E-03	7.4E-04	NC	NC	NC	2.9E-03	5.8E-04	NC	NC	NC	5.8E-03	1.2E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(a)anthracene	56-55-3	1.7E-02	1.7E-03	NC	NC	NC	1.0E-02	1.0E-03	NC	NC	NC	2.0E-02	2.0E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(a)pyrene	50-32-8	1.2E-01	1.2E-02	NC	NC	NC	3.9E-02	3.9E-03	NC	NC	NC	7.7E-02	7.7E-03	NC	NC	NC	1.2E-01	2.4E-02	NC	NC	NC	7.5E-03	1.5E-03	NC	NC	NC
Benzo(b)fluoranthene	205-99-2	3.1E-02	3.1E-03	NC	NC	NC	4.0E-02	4.0E-03	NC	NC	NC	7.6E-02	7.6E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(g,h,i)perylene	191-24-2	1.7E-01	3.4E-02	NC	NC	NC	1.0E-01	2.0E-02	NC	NC	NC	2.0E-01	3.9E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(k)fluoranthene	207-08-9	1.8E-03	1.8E-04	NC	NC	NC	9.1E-04	9.1E-05	NC	NC	NC	1.7E-03	1.7E-04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chrysene	218-01-9	1.8E-03	1.8E-04	NC	NC	NC	8.0E-04	8.0E-05	NC	NC	NC	1.5E-03	1.5E-04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Dibenz(a,h)anthracene	53-70-3	6.9E-04	6.9E-05	NC	NC	NC	1.5E-03	1.5E-04	NC	NC	NC	2.9E-03	2.9E-04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoranthene	206-44-0	8.8E-03	1.8E-03	NC	NC	NC	2.9E-03	5.8E-04	NC	NC	NC	5.8E-03	1.2E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Indeno(1,2,3-cd)pyrene	193-39-5	3.4E-04	3.4E-05	NC	NC	NC	1.2E-03	1.2E-04	NC	NC	NC	2.3E-03	2.3E-04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Phenanthrene	85-01-8	2.4E-02	4.9E-03	NC	NC	NC	8.0E-03	1.6E-03	NC	NC	NC	1.6E-02	3.2E-03	NC	NC	NC	7.7E-02	1.5E-02	NC	NC	NC	1.5E-03	2.9E-04	NC	NC	NC
Pyrene	129-00-0	1.9E-02	3.8E-03	NC	NC	NC	6.3E-03	1.3E-03	NC	NC	NC	1.2E-02	2.5E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Explosives																										
1,3,5-Trinitrobenzene	99-35-4	**2.1E+00**	4.1E-01	**2.1E+00**	3.8E-01	7.6E-02	6.8E-01	1.4E-01	NC	NC	NC	**1.3E+00**	2.7E-01	**1.3E+00**	4.0E-04	8.0E-05	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
2,4,6-Trinitrotoluene	118-96-7	**4.5E+01**	**1.1E+01**	**1.1E+01**	**2.1E+00**	5.3E-01	**1.5E+01**	**3.7E+00**	**3.8E+00**	3.9E-01	9.7E-02	**3.0E+01**	**7.4E+00**	**7.5E+00**	2.2E-03	5.5E-04	**3.1E+03**	**1.2E+02**	**7.8E+02**	**1.8E+02**	**7.1E+00**	**7.5E+01**	**2.9E+00**	**1.9E+01**	--	--
2,4-Dinitrotoluene	121-14-2	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	**2.9E+02**	**2.4E+01**	**2.6E+02**	**6.0E+01**	**4.8E+00**	**7.2E+00**	5.8E-01	**6.3E+00**	--	--
2-Amino-4,6-Dinitrotoluene	355-72-78-2	**3.1E+00**	5.8E-01	5.2E-01	9.6E-02	1.8E-02	**1.0E+00**	1.9E-01	1.7E-01	1.7E-02	3.3E-03	**2.0E+00**	3.8E-01	3.4E-01	1.0E-04	1.9E-05	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
4-Amino-2,6-Dinitrotoluene	1946-51-0	**4.5E+00**	8.5E-01	7.5E-01	1.4E-01	2.6E-02	**1.5E+00**	2.8E-01	2.5E-01	2.5E-02	4.7E-03	**3.0E+00**	5.5E-01	4.9E-01	1.4E-04	2.7E-05	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	121-82-4	**1.9E+00**	3.7E-01	3.4E-01	1.1E-02	2.2E-03	6.1E-01	1.2E-01	NC	NC	NC	**1.2E+00**	2.4E-01	2.2E-01	1.9E-05	3.8E-06	**5.3E+00**	5.3E-01	9.7E-01	8.4E-02	8.4E-03	2.1E-01	2.1E-02	NC	NC	NC
Nitroglycerin																										
Nitroglycerin	55-63-0	**4.7E+01**	**4.4E+00**	**4.7E+01**	**1.7E+01**	**1.6E+00**	**1.7E+01**	**1.6E+00**	**1.7E+01**	**9.3E+00**	8.7E-01	**3.1E+01**	**2.9E+00**	**3.1E+01**	2.3E-02	2.1E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
CAS = Chemical Abstract Services
NC = Not Calculated
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
HQ = Hazard Quotient
EPC = Exposure Point Concentration
-- = Refined Mammal BAF is 0; therefore, bioaccumulation of these chemicals not a concern for the red-tailed hawk

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APPENDIX F.4

THREATENED AND ENDANGERED SPECIES CORRESPONDENCE

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URS

April 13, 2004

Ms. René Hypes, Project Review Coordinator
Division of Natural Heritage
Virginia Department of Conservation and Recreation
217 Governor Street
Richmond, VA 23219

Subject: Natural Heritage Project Review

Dear Ms. Hypes:

I am writing to request information concerning threatened and endangered species potentially inhabiting the area in the vicinity of an industrial site located near the town of Radford, VA. URS is performing an ecological risk assessment of the site. This information is needed to update information we received from a prior request (Invoice Number: H-3243, 4/10/03).

The site is located in the Valley and Ridge Province in western Montgomery County and eastern Pulaski County, VA. Land use surrounding the site is largely undeveloped due to steep terrain, although less rugged areas are primarily used for agriculture.

A portion of a topographic map (Radford North,VA quad) is attached which specifies the location of the site. Please perform a search of the area within a one-mile radius of this location and notify us of any threatened or endangered species and/or critical or protected habitats known to occur in this vicinity.

If you should have any questions concerning this request, please contact me at 215-542-3800. I thank you for your assistance in this matter.

Sincerely,

Doreen LaPorta

Doreen LaPorta
Biologist

Enclosures(2)

URS Corporation
1400 Union Meeting Road, Suite 202
Blue Bell, PA 19422-1972
Tel: 215.542.3800
Fax: 215.542.3888

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street
Richmond, Virginia 23219-2010
Telephone (804) 786-7951 FAX (804) 371-2674 TDD (804) 786-2121

Doreen LaPorta
URS
1400 Union Meeting Road, Suite 202
Blue Bell, PA 19422-1972

May 17, 2004

Re: Industrial Site, Valley and Ridge in western Montgomery County

Dear Ms. LaPorta:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the topographic map, this project either overlies or is adjacent to a karst landscape characterized by sinkholes, caves, disappearing streams, and large springs. The project has been sent to the Virginia Karst Program and to the Virginia Speleological Survey for review for documented sensitive karst features and caves. A significant cave has been documented in the project vicinity. Please coordinate with the Virginia Karst Program at 540-831-4056 (worndorff@dcr.state.va.us) to avoid, minimize, or mitigate impacts.

Our files also do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of $ 95.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, Department of Conservation and Recreation, 203 Governor Street, Suite 414, Richmond, VA 23219, ATTN: Cashier. Payment is due within thirty days of the invoice date.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

S. René Hypes
Project Review Coordinator

CC: Wil Orndorff, DCR

URS

April 13, 2004

Ms. Roberta Hylton
Project Leader, Southwest Virginia Field Office
U.S. Fish and Wildlife Service
330 Cummings Street
Abingdon, VA 24210

Subject: Threatened and Endangered Species Review

Dear Ms. Hylton:

I am writing to request information concerning threatened and endangered species potentially inhabiting the area in the vicinity of an industrial site located near the town of Radford, VA. URS is performing an ecological risk assessment of the site. This information is needed to update information we received from a prior request (Project #2918, 4/21/03).

The site is located in the Valley and Ridge Province in western Montgomery County and eastern Pulaski County, VA. Land use surrounding the site is largely undeveloped due to steep terrain, although less rugged areas are primarily used for agriculture.

A portion of a topographic map (Radford North,VA quad) is attached which specifies the location of the site. Please perform a search of the area within a one-mile radius of this location and notify us of any threatened or endangered species and/or critical or protected habitats known to occur in this vicinity.

If you should have any questions concerning this request, please contact me at 215-542-3800. I thank you for your assistance in this matter.

Sincerely,

Doreen LaPorta

Doreen LaPorta
Biologist

Enclosure

URS Corporation
1400 Union Meeting Road, Suite 202
Blue Bell, PA 19422-1972
Tel: 215.542.3800
Fax: 215.542.3888

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061

May 10, 2004

Ms. Doreen LaPorta
URS Corporation
1400 Union Meeting Road, Suite 202
Blue Bell, Pennsylvania 19422

Re: Project #3348

Greetings:

The U.S. Fish and Wildlife Service (Service) has received your request to review the attached project for potential impacts to federally listed or proposed endangered and threatened species and designated critical habitat in Virginia pursuant to the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). Attached is a list of species with Federal status and species of concern that have been documented or may occur in the county where your project is located. This list was prepared by this office and is based on information obtained from previous surveys for rare and endangered species.

In order to ensure coordination with the State agencies, we consistently recommend that individuals contact the Virginia Department of Conservation and Recreation, Division of Natural Heritage **and** the Virginia Department of Game and Inland Fisheries, since each agency maintains a different database and has differing expertise and/or regulatory responsibility. You can contact these agencies at the following addresses:

Virginia Department of Game and Inland Fisheries
Environmental Services Section
P.O. Box 11104
Richmond, VA 23230
(804) 367-1000

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 2nd Floor
Richmond, VA 23219
(804) 786-7951

If either of these agencies determines that your project may impact a federally listed, proposed, or candidate species OR federally designated critical habitat, please contact this office and provide a copy of the response letter from each agency and the above referenced project number; otherwise, further contact with this office is not necessary.

If you have any questions or need further assistance, please contact Ms. Jolie Harrison at (804) 693-6694, extension 208.

Sincerely,

Karen L. Mayne

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

PULASKI COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
INVERTEBRATES		
Polygyriscus virginianus	Virginia fringed mountain snail	LE
MAMMALS		
Corynorhinus townsendii virginianus[1]	Virginia big-eared bat	LE
Myotis sodalis[1]	Indiana bat	LE
VASCULAR PLANTS		
Echinacea laevigata	Smooth coneflower	LE

Species of Concern

FISH		
Ethcostoma osburni	Candy darter	G3
INVERTEBRATES		
Caecidotea henroti	Henrot's cave isopod	G2
Glyphyalinia raderi	Maryland glyph	G2
Lasmigona subviridis	Green floater	G3
Pseudanophthalmus sp. 7	A cave beetle	G1
Pyrgus wyandot	Appalachian grizzled skipper	G2
Rhagidia varia	A cave mite	G3
Speyeria diana	Diana fritillary	G3
Speyeria idalia	Regal fritillary	G3
Stygobromus abditus	James cave amphipod	G1
VASCULAR PLANTS		
Buckleya distichophylla	Piratebush	G2
Cardamine flagellifera	A bittercress	G3
Carex schweinitzii[1]	Schweinitz's sedge	G3
Clematis coactilis	Virginia white-haired leatherflower	G3
Delphinium exaltatum	Tall larkspur	G3
Paxistima canbyi	Canby's mountain-lover	G2
Phlox beckleyi	Sword-leaved phlox	G2
Poa paludigena[1]	Bog bluegrass	G3

[1]This species has been documented in an adjacent county and may occur in this county.

June 25, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

MONTGOMERY COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
FISH		
Percina rex	Roanoke logperch	LE
MAMMALS		
Corynorhinus townsendii virginianus[1]	Virginia big-eared bat	LE
Myotis sodalis[1]	Indiana bat	LE
VASCULAR PLANTS		
Echinacea laevigata	Smooth coneflower	LE

Species of Concern

FISH		
Noturus gilberti	Orangefin madtom	G2
Phenacobius teretulus	Kanawha minnow	G3
Scartomyzon ariommus	Bigeye jumprock	G2
INVERTEBRATES		
Allocapnia simmonsi	Simmons' slender winter stonefly	G2
Atrytone arogos arogos	Arogos skipper	G3G4T1T2
Caecidotea vandeli	Vandel's cave isopod	G2
Catocala dulciola	Sweet underwing	G3
Catocala herodias gerhardi	Herodias underwing	G3T3
Lasmigona holstonia	Tennessee heelsplitter	G2G3
Lasmigona subviridis	Green floater	G3
Pseudanophthalmus pusio	A cave beetle	G3
Pyrgus wyandot	Appalachian grizzled skipper	G2
Speyeria diana	Diana fritillary	G3
Speyeria idalia	Regal fritillary	G3
Stygobromus fergusoni	Montgomery County cave amphipod	G1
VASCULAR PLANTS		
Bucklcya distichophylla	Piratebush	G2
Carex schweinitzii	Schweinitz's sedge	G3
Clematis addisonii	Addison's leatherflower	G2
Clematis coactilis	Virginia white-haired leatherflower	G3

June 25, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

SCIENTIFIC NAME	COMMON NAME	STATUS
Delphinium exaltatum	Tall larkspur	G3
Monotropsis odorata	Sweet pine sap	G3
Paxistima canbyi	Canby's mountain-lover	G2
Phlox buckleyi	Sword-leaved phlox	G2
Poa paludigena[1]	Bog bluegrass	G3

[1]This species has been documented in an adjacent county and may occur in this county.

June 25, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

PULASKI COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
INVERTEBRATES		
Polygyriscus virginianus	Virginia fringed mountain snail	LE
MAMMALS		
Corynorhinus townsendii virginianus[1]	Virginia big-eared bat	LE
Myotis sodalis[1]	Indiana bat	LE
VASCULAR PLANTS		
Echinacea laevigata	Smooth coneflower	LE

Species of Concern

FISH			
Etheostoma osburni	Candy darter	G3	
INVERTEBRATES			
Caecidotea henroti	Henrot's cave isopod	G2	
Glyphyalinia raderi	Maryland glyph	G2	
Lasmigona subviridis	Green floater	G3	
Pseudanophthalmus sp. 7	A cave beetle	G1	
Pyrgus wyandot	Appalachian grizzled skipper	G2	
Rhagidia varia	A cave mite		G3
Speyeria diana	Diana fritillary		G3
Speyeria idalia	Regal fritillary		G3
Stygobromus abditus	James cave amphipod		G1
VASCULAR PLANTS			
Buckleya distichophylla	Piratebush	G2	
Cardamine flagellifera	A bittercress		G3
Carex schweinitzii[1]	Schweinitz's sedge	G3	
Clematis coactilis	Virginia white-haired leatherflower	G3	
Delphinium exaltatum	Tall larkspur		G3
Paxistima canbyi	Canby's mountain-lover	G2	
Phlox beckleyi	Sword-leaved phlox		G2
Poa paludigena[1]	Bog bluegrass	G3	

[1]This species has been documented in an adjacent county and may occur in this county.

June 25, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

APPENDIX G

REMEDIAL GOALS AND RESIDUAL RISK CALCULATIONS

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APPENDIX G.1

AREA A REMEDIAL GOALS

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Table G.1-1a
Remedial Goal Calculation Equations - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Remedial Goal Equations used for Groundwater Noncarcinogens - Adult and Child Resident

Ingestion
Noncarcinogens

$$RG_o = \frac{THQ*BW*AT\text{-}N*RfD_o}{EF*ED*IR\text{-}W*CF_3}$$

Dermal
Noncarcinogens
Inorganic:

$$RG_d = \frac{THQ*BW*AT\text{-}N*RfD_d}{SA*K_p*EF*t_{event}*ED*EV*CF_2*CF_3}$$

For organics if t_{event} is less than t*:

$$RG_d = \frac{THQ*BW*AT\text{-}N*RfD_d}{SA*EF*ED*EV*2*FA*K_p*CF_2*CF_3\ (6*tau*t_{event}/pi)^{1/2}}$$

For organics if ET is greater than t*:

$$RG_d = \frac{THQ*BW*AT\text{-}N*RfD_d}{SA*EF*ED*EV*FA*K_p*CF_2*CF_3*((t_{event}(1+B))+2*tau*((1+3B+B^2)/((1+3B)^2)))}$$

Inhalation
Note - VOCs not Identified as COPC for site
Indoor Vapors
Carcinogens and Noncarcinogens
RG_i= Modeled Using Johnson and Ettinger Model

Vapors While Showering
Carcinogens and Noncarcinogens
RG_i= Modeled Using Foster and Chrostowski Inhalation Model

Table G.1-1a
Remedial Goal Calculation Equations - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Remedial Goal Equations used for Groundwater-Lifetime Resident-Carcinogens

Ingestion

Carcinogens

$$RG_o = \left(\frac{TR}{CSF_o}\right) * \left[\left(\frac{BW * AT - C}{EF * ED * IR - W * CF_3}\right)_{child} + \left(\frac{BW * AT - C}{EF * ED * IR - W * CF_3}\right)_{adult}\right]$$

Dermal

Carcinogens

Inorganic:

$$RG_d = \left(\frac{TR}{CSF_d}\right) * \left[\left(\frac{BW * AT - C}{SA * K_p * t_{event} * EF * ED * EV * CF_2 * CF_3}\right)_{child} + \left(\frac{BW * AT - C}{SA * K_p * t_{event} * EF * ED * EV * CF_2 * CF_3}\right)_{adult}\right]$$

For organics if t_{event} is less than t*:

$$RG_d = \left(\frac{TR}{CSF_d}\right) * \left[\left(\frac{BW * AT - C}{SA * EF * ED * EV * 2 * FA * K_p * CF_2 * CF_3 * (6 * tau * t_{event} / pi)^{1/2}}\right)_{child} + \left(\frac{BW * AT - C}{SA * EF * ED * EV * 2 * FA * K_p * CF_2 * CF_3 * (6 * tau * t_{event} / pi)^{1/2}}\right)_{adult}\right]$$

For organics if ET is greater than t*:

$$RG_d = \left(\frac{TR}{CSF_d}\right) * \left[\left(\frac{BW * AT - C}{SA * EF * ED * EV * FA * K_p * CF_2 * CF_3 * (t_{event}(1+B) + 2tau((1+3B+3B^2)/(1+B)^2))}\right)_{child} + \left(\frac{BW * AT - C}{SA * EF * ED * EV * FA * K_p * CF_2 * CF_3 * (t_{event}(1+B) + 2tau((1+3B+3B^2)/(1+B)^2))}\right)_{adult}\right]$$

Inhalation

Note: VOCs not identified as COPC for the site

Overall Remedial Goal Equation

$$RG = \frac{1}{(1/RG_o + 1/RG_d + 1/RG_i)}$$

Table G.1-1a
Remedial Goal Calculation Equations - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NOTES:

RG =	remedial goal groundwater	ug/L
TR =	target risk	unitless
THQ =	target hazard quotient	unitless

Receptor specific parameters provided in Appendix E.1, Table E.1-4.2

BW =	body weight (receptor specific - kg)	kg
AT-C =	averaging time (25,550 days)	days
AT-N =	averaging time (receptor specific)	days
EF =	exposure frequency (receptor specific)	days/year
ED =	exposure duration (receptor specific)	years
ET =	exposure time (receptor specific)	hours/day
EV =	event frequency (receptor specific)	events/day
t_{event} =	event duration (receptor specific)	hr/event
SA =	skin surface contact area (receptor specific)	cm^2
IR-W =	ingestion rate - water (receptor specific)	L/day

Toxicity Data provided in Appendix E.1, Tables E.1-5.1, E.1-5.2, E.1-6.1, and E.1-6.2

RfD_o =	oral reference dose (see Table E.1-5.1)	mg/kg-day
RfD_d =	dermal reference dose (see Table E.1-5.1)	mg/kg-day
RfD_i =	inhalation reference dose (see Table E.1-5.2)	mg/kg-day
CSF_o =	oral carcinogenic slope factor (see Table E.1-6.1)	$(mg/kg\text{-}day)^{-1}$
CSF_d =	dermal carcinogenic slope factor (see Table E.1-6.1)	$(mg/kg\text{-}day)^{-1}$
CSF_i =	inhalation carcinogenic slope factor (see Table E.1-6.2)	$(mg/kg\text{-}day)^{-1}$

Additional parameters used for groundwater calculations provided in Appendix E.1, Table E.1-4.5

K_p =	permeability constant	cm/hr
FA =	fraction absorbed	unitless
tau =	lag time	hours
t* =	time to reach steady state	hours
pi =	pi (approximate value 3.14)	unitless
B =	lipophilic property	unitless
CF_1 =	conversion factor (1E-06)	kg/mg
CF_2 =	conversion factor (1E-03)	cm^3/L
CF_3 =	conversion factor (1E-03)	mg/ug

Table G.1-1b
Noncarcinogenic Remedial Goal Calculation - Groundwater - Adult and Child Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammuntion Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Receptor:	Adult Resident

	INGESTION	DERMAL			INHALATION		Remedial Goal Calculation				
								Noncancer RG (ug/L)			
Chemical	RfDo (mg/kg-day)	RfDd (mg/kg-day)	Adult DA event	Ingestion/Dermal Target Organ	RfDi (mg/kg-day)	Inhalation Target Organ	THQ	RG_o	RG_d	RG_i	RG
2,4,6-Trinitrotoluene	0.0005	5.00E-04	3.16E-09	liver	--	--	1	1.83E+01	3.91E+07	--	1.82E+01
Dinitrotoluene Mix	--	--	6.84E-09	--	--	--	--	--	--	--	--
RDX	0.003	3.00E-03	9.97E-10	prostate	--	--	1	1.10E+02	7.42E+08	--	1.09E+02
Perchlorate	0.0007	7.00E-04	5.80E-10	thyroid	--	--	1	2.56E+01	2.98E+08	--	2.55E+01

Scenario Timeframe:	Future
Medium:	Groundwater
Receptor:	Child Resident

	INGESTION	DERMAL			INHALATION		Remedial Goal Calculation				
								Noncancer RG (ug/L)			
Chemical	RfDo (mg/kg-day)	RfDd (mg/kg-day)	Adult DA event	Ingestion/Dermal Target Organ	RfDi (mg/kg-day)	Inhalation Target Organ	THQ	RG_o	RG_d	RG_i	RG
2,4,6-Trinitrotoluene	0.0005	5.00E-04	4.14E-09	liver	--	--	1	7.82E+00	5.09E+07	--	7.82E+00
Dinitrotoluene Mix	--	--	8.99E-09	--	--	--	--	--	--	--	--
RDX	0.003	3.00E-03	1.31E-09	prostate	--	--	1	4.69E+01	9.67E+08	--	4.69E+01
Perchlorate	0.0007	7.00E-04	1.00E-09	thyroid	--	--	1	1.10E+01	2.95E+08	--	1.09E+01

Notes:

See Table G.1-1a for Remedial Goal Equations and acronyms

Table G.1-1c
Carcinogenic Remedial Goal Calculation - Groundwater - Lifetime Resident - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammuntion Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Groundwater
Receptor:	Lifetime Resident

	INGESTION	DERMAL			INHALATION	Remedial Goal Calculation								
							Cancer RG (ug/L)				Noncancer RG (ug/L)		Lowest RG	Lowest RG
Chemical	CSF_o (mg/kg-day -1)	CSF_d (mg/kg-day -1)	Adult DA event	Child DA event	CSF_i (mg/kg-day -1)	TR	RG_o	RG_d	RG_i	$RG_{lifetime}$	$RG_{child\ resid}$	$RG_{adult\ resid}$	(ug/L)	Source
2,4,6-Trinitrotoluene	0.03	0.03	3.16E-09	4.14E-09	--	1.00E-05	2.24E+01	8.00E+02	--	2.18E+01	7.82E+00	1.82E+01	7.82E+00	Child Resident - Noncarc
Dinitrotoluene Mix	0.68	0.68	6.84E-09	8.99E-09	--	1.00E-05	9.89E-01	1.63E+01	--	9.32E-01	--	--	9.32E-01	Lifetime Resident - Carc
RDX	0.11	0.03	9.97E-10	1.31E-09	--	1.00E-05	6.11E+00	2.53E+03	--	6.10E+00	4.69E+01	1.09E+02	6.10E+00	Lifetime Resident - Carc
Perchlorate	--	--	5.80E-10	1.00E-09	--	--	--	--	--	--	1.09E+01	2.55E+01	1.09E+01	Child Resident - Noncarc

Notes:
See Table G.1-1a for Remedial Goal Equations and acronyms
See Table G.1-1b for Adult and Child Resident Noncarcinogenic Remedial Goal Calculations

Table G.1-2a
Soil-to-Groundwater RG for 2,4,6-Trinitrotoluene using RG_{gw}
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
RG_{gw}	GW Concentration Source=	0.00782	mg/L
C_w =	Target Leachate Conc =	0.09384	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.870E-05	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1834	L/kg

$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.34	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**1.7**	**mg/kg**

Table G.1-2b
Soil-to-Groundwater RG for DNT Mixture (50% 2,4-DNT, 50% 2,6-DNT) using RG_{gw}
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
RG_{gw}	GW Concentration Source=	0.000932	mg/L
C_w =	Target Leachate Conc =	0.01118	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.620E-05	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	371	L/kg

$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	3.714	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.044**	**mg/kg**

Table G.1-2c
Soil-to-Groundwater RG for RDX using RGgw
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
RG_{gw}	GW Concentration Source=	0.0061	mg/L
C_w =	Target Leachate Conc =	0.07320	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.580E-06	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	195	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.95	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.161**	**mg/kg**

Table G.1-2d
Soil-to-Groundwater RG for Aminodinitrotoluenes using T-RBC
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	0.073	mg/L
C_w =	Target Leachate Conc =	0.87600	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	6.620E-09	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	101	L/kg

$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.005	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**1.095**	**mg/kg**

Table G.1-2e
Soil-to-Groundwater RG for Nitroglycerin using T-RBC
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	0.0037	mg/L
C_w =	Target Leachate Conc =	0.04440	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.040E-07	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	130.8	L/kg

$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) : $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.308	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.069**	**mg/kg**

Table G.1-2f
Soil-to-Groundwater RG for Heptachlor Epoxide using T-RBC
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	7.4E-06	mg/L
C_w =	Target Leachate Conc =	8.88E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	8.590E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	5.26E+03	L/kg

$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	52.6	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.0047**	**mg/kg**

Table G.1-2g
Soil-to-Groundwater RG for 2,3,7,8-TCDD TEQ using T-RBC
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	12	--
T-RBC	GW Concentration Source=	4.5E-10	mg/L
C_w =	Target Leachate Conc =	5.40E-09	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.040E-03	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.46E+05	L/kg

$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1460	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**7.89E-06**	**mg/kg**

Table G.1-3a
Soil Sample Assemblages for Post-Remedial Action Residual Risk Assessment - Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Area A				
Surface Soil Samples for Post-Remedial Action Residual Risk Assessment				
54SB10A	54SB22A	54SB35A	54SB81A	
54SB17A	54SB24A	54SB36A	54SB82A	
54SB18A	54SB26A	54SB37A	54SB83A	
54SB19A	54SB28A	54SB38A	54SB84A	
54SB20A	54SB29A	54SB58A		
54SB21A	54SB34A	54SB61A		
Subsurface Soil Samples for Post-Remedial Action Residual Risk Assessment				
54SB3B	54SB24B	54SB35B	54SB82B	
54SB10B	54SB26B	54SB36B	54SB83B	
54SB17B	54SB27B	54SB37B	54SB84B	
54SB18B	54SB28B	54SB38B	54SB3C	
54SB19B	54SB29B	54SB57B	54SB10C	
54SB20B	54SB30B	54SB58B	54SB22C	
54SB21B	54SB33B	54SB61B	54SB27C	
54SB22B	54SB34B	54SB81B	54SB84C	
Samples Collected Outside Fence Excluded from HHRA				
54SB56A	54SB67A	54SB62B	54SB69B	54SB64C
54SB59A	54SB68A	54SB63B	54SB70B	54SB65C
54SB60A	54SB69A	54SB64B	54SB56C	54SB66C
54SB62A	54SB70A	54SB65B	54SB59C	54SB67C
54SB63A	54SB56B	54SB66B	54SB60C	54SB68C
54SB64A	54SB59B	54SB67B	54SB62C	54SB69C
54SB65A	54SB60B	54SB68B	54SB63C	54SB70C
54SB66A				
Samples Collected at a Depth >15' Excluded from HHRA				
54SB23C	54SB81C			
54SB32C	54SB82C			
54SB34C	54SB83C			
54SB38C				
54SB57C				
54SB58C				
54SB61C				
Samples Removed Due to Remedial Action				
54SB3A	54SB25B	54SB31B		
54SB3B	54SB27A	54SB32A		
54SB23A	54SB30A	54SB32B		
54SB23B	54SB30B	54SB33A		
54SB25A	54SB31A	54SB57A		

Table G.1-3b
Area A COPC Determination - Surface Soil - Post Removal Action
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Surface Soil		**TAL Metals**														
	7429-90-5	Aluminum	6,620	15,600	mg/kg	54SB24A	17/17	2.4 - 6.8	15,600	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.04	0.76	mg/kg	54SB34A (D)	6/14	0.0386 - 0.43	0.76	3.13	N	40.88	N	IND	N	BSL
	7440-38-2	Arsenic	0.67	1.6	mg/kg	54SB38A (D)	17/17	0.058 - 0.36	1.6	0.426	C	1.91	C	IND	Y	**ARES**
	7440-39-3	Barium	105	206	mg/kg	54SB38A (D)	17/17	0.02 - 0.103	206	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.22	1	mg/kg	54SB38A (D)	17/17	0.01 - 0.0267	1	15.6	N	204	N	IND	N	BSL
	7440-43-9	Cadmium	0.1	1.4	mg/kg	54SB58A (D)	4/17	0.03 - 0.25	1	7.8	N	102.2	N	IND	N	BSL
	7440-70-2	Calcium	1,020	21,500	mg/kg	54SB21A	17/17	1 - 17.5	21,500	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium [1]	12	22.0	mg/kg	54SB37A	17/17	0.07 - 0.998	22.0	23.5	N	306.6	N	IND	N	BSL
	7440-48-4	Cobalt	5.8	10	mg/kg	54SB37A	17/17	0.07 - 0.233	10	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	3.9	84.1	mg/kg	54SB34A (D)	17/17	0.15 - 0.516	84.1	313	N	4,088	N	IND	N	BSL
	7439-89-6	Iron	13,700	24,500	mg/kg	54SB38A (D)	17/17	0.731 - 1.7	24,500	5,475	N	71,540	N	IND	Y	**ARES**
	7439-92-1	Lead [2]	6.4	528	mg/kg	54SB34A (D)	18/18	0.041 - 0.29	528	400	--	750	--	AL	Y	**ARES**
	7439-95-4	Magnesium	1,880	4,490	mg/kg	54SB24A	17/17	0.66 - 7.67	4,490	--	--	156,400	--	RDA	N	BSL
	7439-96-5	Manganese	309	909	mg/kg	54SB38A (D)	17/17	0.02 - 0.474	909	156	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury [3]	0.017	0.06	mg/kg	54SB18A	17/17	0.0077 - 0.021	0.06	2.3	N	31	N	IND	N	BSL
	7440-02-0	Nickel	8.4	13.4	mg/kg	54SB37A	17/17	0.0775 - 0.13	13.4	156	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	832	1,510	mg/kg	54SB38A (D)	17/17	4.4 - 14.9	1,510	--	--	2,607,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.057	2	mg/kg	54SB38A (D)	16/17	0.0486 - 0.41	2	39.1	N	511	N	IND	N	BSL
	7440-22-4	Silver	0.049	0.05	mg/kg	54SB58A (D)	2/17	0.0178 - 0.1	0.05	39.1	N	511	N	IND	N	BSL
	7440-23-5	Sodium	38	469	mg/kg	54SB38A (D)	14/17	27.1 - 36.4	469	--	--	625,700	--	RDA	N	BSL
	7440-28-0	Thallium	0.120	0.2	mg/kg	54SB58A (D)	2/13	0.0733 - 0.64	0.2	0.548	N	7.15	N	IND	N	BSL
	7440-62-2	Vanadium	16	39.9	mg/kg	54SB24A	17/17	0.08 - 0.401	39.9	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	47.9	337	mg/kg	54SB34A (D)	17/17	0.11 - 0.789	337	2,346	N	30,660	N	IND	N	BSL
		TCL Pesticides/PCBs														
	72-55-9	4,4'-DDE	ND	ND	mg/kg	NA	0/7	--	ND	1.9E+00	C	8.4E+00	C	IND	N	NA
	50-29-3	4,4'-DDT	ND	ND	mg/kg	NA	0/7	--	ND	1.9E+00	C	8.4E+00	C	IND	N	NA
	5103-71-9	alpha-Chlordane [4]	ND	ND	mg/kg	NA	0/7	--	ND	1.8E+00	C	8.2E+00	C	IND	N	NA
	319-86-8	delta-BHC [5]	ND	ND	mg/kg	NA	0/7	--	ND	1.0E-01	C	4.5E-01	C	IND	N	NA
	1031-07-8	Endosulfan Sulfate [6]	ND	ND	mg/kg	NA	0/7	--	ND	4.7E+01	N	6.1E+02	N	IND	N	NA
	7421-93-4	Endrin aldehyde [7]	ND	ND	mg/kg	NA	0/7	--	ND	2.3E+00	N	3.1E+01	N	IND	N	NA
	58-89-9	gamma-BHC (Lindane)	ND	ND	mg/kg	NA	0/7	--	ND	4.9E-01	C	2.2E+00	C	IND	N	NA
	5103-74-2	gamma-Chlordane [4]	ND	ND	mg/kg	NA	0/7	--	ND	1.8E+00	C	8.2E+00	C	IND	N	NA
	76-44-8	Heptachlor	ND	ND	mg/kg	NA	0/7	--	ND	1.4E-01	C	6.4E-01	C	IND	N	NA
	1024-57-3	Heptachlor epoxide	ND	ND	mg/kg	NA	0/7	--	ND	7.0E-02	C	3.1E-01	C	IND	N	NA
	72-43-5	Methoxychlor	ND	ND	mg/kg	NA	0/7	--	ND	3.9E+01	N	5.1E+02	N	IND	N	NA
	11097-69-1	Aroclor 1254 [8]	ND	ND	mg/kg	NA	0/7	--	ND	1.6E-01	N	1.4E+00	C	IND	N	NA
	11096-82-5	Aroclor 1260	ND	ND	mg/kg	NA	0/7	--	ND	3.2E-01	C	1.4E+00	C	IND	N	NA
		TCL SVOCs														
	88-74-4	2-Nitroaniline	ND	ND	mg/kg	NA	0/11	--	ND	--	--	--	--	--	N	NA
	117-81-7	Bis(2-ethylhexyl)phthalate	6.1E-02	1.5E-01	mg/kg	54SB22A (B)	7/11	0.032 - 0.032	1.5E-01	4.6E+01	C	2.0E+02	C	IND	N	BSL
	84-74-2	Di-n-butylphthalate	4.9E-02	2.0E-01	mg/kg	54SB28A	2/11	0.38 - 0.4	2.0E-01	7.8E+02	N	1.0E+04	N	IND	N	BSL
	117-84-0	Di-n-octylphthalate	5.7E-02	3.2E-01	mg/kg	54SB28A	5/11	0.38 - 0.4	3.2E-01	--	--	--	--	--	Y	NSV
	84-66-2	Diethylphthalate	1.2E-01	2.7E-01	mg/kg	54SB26A	2/11	0.38 - 0.4	2.7E-01	6.3E+03	N	8.2E+04	N	IND	N	BSL
	86-30-6	N-Nitrosodiphenylamine	ND	ND	mg/kg	NA	0/11	--	ND	1.3E+02	C	5.8E+02	C	IND	N	NA
		Dioxin/Furans														
	--	Total 2,3,7,8-TCDD Equivalents	3.8E-08	8.6E-08	mg/kg	54SB34A (D)	3/3	--	8.6E-08	4.3E-06	C	1.9E-05	C	IND	N	BSL
		PAHs														
	83-32-9	Acenaphthene	3.3E-02	8.1E-02	mg/kg	54SB26A	5/7	0.0059 - 0.051	8.1E-02	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene [9]	2.2E-02	3.6E-02	mg/kg	54SB18A	3/11	0.0059 - 0.051	3.6E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	3.6E-03	4.0E-02	mg/kg	54SB21A	7/11	0.0022 - 0.01	4.0E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	50-32-8	Benzo(a)pyrene	3.4E-03	1.9E-02	mg/kg	54SB24A	3/11	0.0016 - 0.01	1.9E-02	2.2E-02	C	3.9E-01	C	IND	N	BSL
	205-99-2	Benzo(b)fluoranthene	5.2E-03	2.8E-02	mg/kg	54SB27A (D)	4/11	0.0017 - 0.01	2.8E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	191-24-2	Benzo(g,h,i)perylene [9]	3.2E-02	3.2E-02	mg/kg	54SB24A	1/11	0.0036 - 0.01	3.2E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	3.7E-03	4.0E-02	mg/kg	54SB24A	4/11	0.0014 - 0.01	4.0E-02	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	4.5E-03	4.2E-02	mg/kg	54SB21A	5/11	0.0024 - 0.01	4.2E-02	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	1.6E-02	3.6E-02	mg/kg	54SB24A	2/11	0.0042 - 0.01	3.6E-02	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	206-44-0	Fluoranthene	4.8E-03	5.7E-02	mg/kg	54SB24A	11/11	0.0021 - 0.02	5.7E-02	3.1E+02	N	4.1E+03	N	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	1.4E-02	1.1E-01	mg/kg	54SB24A	2/11	0.0025 - 0.01	1.1E-01	2.2E-01	C	3.9E+00	C	IND	N	BSL
	91-20-3	Naphthalene	4.6E-02	2.1E-01	mg/kg	54SB28A	5/6	0.014 - 0.049	2.1E-01	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene [9]	1.9E-02	2.7E-02	mg/kg	54SB22A (B)	3/11	0.0085 - 0.051	2.7E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	1.3E-02	7.0E-02	mg/kg	54SB21A	7/11	0.0043 - 0.02	7.0E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL

Table G.1-3b
Area A COPC Determination - Surface Soil - Post Removal Action
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
		Explosives														
	99-35-4	1,3,5-Trinitrobenzene	ND	ND	mg/kg	NA	0/9	--	ND	2.3E+02	N	3.1E+03	N	IND	N	NA
	118-96-7	2,4,6-Trinitrotoluene[10]	4.3E-01	4.3E-01	mg/kg	54SB34A (D)	1/20	--	4.3E-01	3.9E+00	N	5.1E+01	N	IND	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	mg/kg	NA	0/20	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	606-20-2	2,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/20	--	ND	7.8E+00	N	1.0E+02	N	IND	N	NA
	--	Dinitrotoluene Mix	ND	ND	mg/kg	NA	0/20	--	ND	9.4E-01	--	4.2E+00	--	IND	N	NA
	35572-78-2	2-Amino-4,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/20	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	1946-51-0	4-Amino-2,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/20	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	--	Aminodinitrotoluenes	ND	ND	mg/kg	NA	0/20	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	ND	ND	mg/kg	NA	0/20	--	ND	3.9E+02	N	5.1E+03	N	IND	N	NA

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
N/C = Noncarcinogenic/Carcinogenic per EPA RBC Table (October 2007)
[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Chlordane RBC value was used
[5] = Alpha-BHC RBC value was used
[6] = Endosulfan RBC value was used
[7] = Endrin RBC value was used
[8] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[9] = Pyrene RBC value was used
[10] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

(A) = Facility-Wide Background Point Estimate as Reported in the Facility-Wide Background Study Report (IT 2001a)
(B) = Re-sampled; Pesticides and PCBs analyzed January 2007.
(D) = Re-sampled; Dioxin/Furans analyzed January 2007.

ARAR = Applicable, Relevant, and Appropriate Requirement
USEPA = U.S. Environmental Protection Agency
TBC = To-Be-Considered
RDA = Recommended Daily Allowance
IND = Adjusted Industrial RBC
AL = USEPA Action Level

ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

ND = Not Detected
NA = Not Applicable

Table G.1-3c
Area A COPC Determination - Total Soil - Post Removal Action
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Total Soil
Exposure Medium:	Total Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Total Soil		**TAL Metals**														
	7429-90-5	Aluminum	5,550	17,400	mg/kg	54SB19B	37/37	2.3 - 7.1	17,400	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.04	4.8	mg/kg	54SB33B	14/30	0.0386 - 0.45	4.8	3.13	N	40.88	N	IND	Y	**ARES**
	7440-38-2	Arsenic	0.29	1.8	mg/kg	54SB34B (D)	36/37	0.058 - 0.37	1.8	0.426	C	1.91	C	IND	Y	**ARES**
	7440-39-3	Barium	57.5	206	mg/kg	54SB38A (D)	37/37	0.02 - 0.103	206	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.22	1.1	mg/kg	54SB17B	37/37	0.01 - 0.0267	1.1	15.6	N	204.4	N	IND	N	BSL
	7440-43-9	Cadmium	0.1	1.5	mg/kg	54SB57B	7/37	0.03 - 0.25	1.5	7.8	N	102.2	N	IND	N	BSL
	7440-70-2	Calcium	666	21,500	mg/kg	54SB21A	37/37	1 - 17.5	21,500	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium [1]	9.7	24.3	mg/kg	54SB29B	37/37	0.06 - 0.998	24.3	23.5	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	4.7	11.4	mg/kg	54SB19B	37/37	0.06 - 0.233	11.4	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	2	84.1	mg/kg	54SB34A (D)	37/37	0.15 - 0.516	84.1	313	N	4,088	N	IND	N	BSL
	7439-89-6	Iron	10,100	24,500	mg/kg	54SB38A (D)	37/37	0.731 - 1.7	24,500	5,475	N	71,540	N	IND	Y	**ARES**
	7439-92-1	Lead [2]	4.4	528	mg/kg	54SB34A (D)	39/39	0.041 - 0.29	528	400	--	750	--	AL	Y	**ARES**
	7439-95-4	Magnesium	1,760	4,490	mg/kg	54SB24A	37/37	0.64 - 7.67	4,490	--	--	156,400	--	RDA	N	BSL
	7439-96-5	Manganese	220	909	mg/kg	54SB38A (D)	37/37	0.02 - 0.474	909	156	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury [3]	0.012	0.22	mg/kg	54SB33B	35/37	0.0077 - 0.021	0.22	2.3	N	31	N	IND	N	BSL
	7440-02-0	Nickel	6.2	16	mg/kg	54SB17B	37/37	0.0775 - 0.13	16	156.4	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	819	1,510	mg/kg	54SB38A (D)	37/37	4.4 - 14.9	1,510	--	--	2,607,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.057	2	mg/kg	54SB38A (D)	34/37	0.0486 - 0.41	2	39.1	N	511	N	IND	N	BSL
	7440-22-4	Silver	0.047	0.061	mg/kg	54SB57B	5/37	0.0178 - 0.1	0.061	39.1	N	511	N	IND	N	BSL
	7440-23-5	Sodium	32	525	mg/kg	54SB33B	34/37	25.9 - 38	525	--	--	625,700	--	RDA	N	BSL
	7440-28-0	Thallium	0.1	0.17	mg/kg	54SB57B	5/28	0.0733 - 0.64	0.17	0.548	N	7.154	N	IND	N	BSL
	7440-62-2	Vanadium	14.6	39.9	mg/kg	54SB24A	37/37	0.07 - 0.401	39.9	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	30.1	337	mg/kg	54SB34A (D)	37/37	0.1 - 0.789	337	2,346	N	30,660	N	IND	N	BSL
		TCL Pesticides/PCBs														
	72-55-9	4,4'-DDE	ND	ND	mg/kg	NA	0/19	--	ND	1.9E+00	C	8.4E+00	C	IND	N	NA
	50-29-3	4,4'-DDT	ND	ND	mg/kg	NA	0/19	--	ND	1.9E+00	C	8.4E+00	C	IND	N	NA
	5103-71-9	alpha-Chlordane [4]	ND	ND	mg/kg	NA	0/19	--	ND	1.8E+00	C	8.2E+00	C	IND	N	NA
	319-86-8	delta-BHC [5]	ND	ND	mg/kg	NA	0/19	--	ND	1.0E-01	C	4.5E-01	C	IND	N	NA
	1031-07-8	Endosulfan Sulfate [6]	ND	ND	mg/kg	NA	0/19	--	ND	4.7E+01	N	6.1E+02	N	IND	N	NA
	7421-93-4	Endrin aldehyde [7]	ND	ND	mg/kg	NA	0/19	--	ND	2.3E+00	N	3.1E+01	N	IND	N	NA
	58-89-9	gamma-BHC (Lindane)	ND	ND	mg/kg	NA	0/19	--	ND	4.9E-01	C	2.2E+00	C	IND	N	NA
	5103-74-2	gamma-Chlordane [4]	ND	ND	mg/kg	NA	0/19	--	ND	1.8E+00	C	8.2E+00	C	IND	N	NA
	76-44-8	Heptachlor	ND	ND	mg/kg	NA	0/19	--	ND	1.4E-01	C	6.4E-01	C	IND	N	NA
	1024-57-3	Heptachlor epoxide	1.9E-03	1.9E-03	mg/kg	54SB33B	1/19	0.00026 - 0.00415	1.9E-03	7.0E-02	C	3.1E-01	C	IND	N	BSL
	72-43-5	Methoxychlor	ND	ND	mg/kg	NA	0/19	--	ND	3.9E+01	N	5.1E+02	N	IND	N	NA
	11097-69-1	Aroclor 1254 [8]	ND	ND	mg/kg	NA	0/19	--	ND	1.6E-01	N	1.4E+00	C	IND	N	NA
	11096-82-5	Aroclor 1260	ND	ND	mg/kg	NA	0/19	--	ND	3.2E-01	C	1.4E+00	C	IND	N	NA
		TCL SVOCs														
	88-74-4	2-Nitroaniline	ND	ND	mg/kg	NA	0/24	--	ND	--	--	--	--	--	N	NA
	117-81-7	Bis(2-ethylhexyl)phthalate	3.0E-02	1.9E-01	mg/kg	54SB22B (B)	15/24	0.032 - 0.032	1.9E-01	4.6E+01	C	2.0E+02	C	IND	N	BSL
	84-74-2	Di-n-butylphthalate	4.9E-02	3.4E-01	mg/kg	54SB33B	3/24	0.38 - 0.42	3.4E-01	7.8E+02	N	1.0E+04	N	IND	N	BSL
	117-84-0	Di-n-octylphthalate	3.5E-02	3.2E-01	mg/kg	54SB28A	8/24	0.38 - 0.42	3.2E-01	--	--	--	--	--	Y	NSV
	84-66-2	Diethylphthalate	1.2E-01	2.7E-01	mg/kg	54SB26A	3/24	0.38 - 0.42	2.7E-01	6.3E+03	N	8.2E+04	N	IND	N	BSL
	86-30-6	N-Nitrosodiphenylamine	1.3E-01	1.3E-01	mg/kg	54SB33B	1/24	0.38 - 0.42	1.3E-01	1.3E+02	C	5.8E+02	C	IND	N	BSL
		Dioxin/Furans														
	--	Total 2,3,7,8-TCDD Equivalents	2.9E-08	2.4E-06	mg/kg	54SB58A (D)	13/13	--	2.4E-06	4.3E-06	C	1.9E-05	C	IND	N	BSL
		PAHs														
	83-32-9	Acenaphthene	2.7E-02	2.6E-01	mg/kg	54SB24B	9/15	0.0058 - 0.053	2.6E-01	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene [9]	1.0E-02	4.3E-02	mg/kg	54SB20B	5/24	0.0059 - 0.053	4.3E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	120-12-7	Anthracene	1.5E-02	1.5E-02	mg/kg	54SB20B	1/24	0.0054 - 0.053	1.5E-02	2.3E+03	N	3.1E+04	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	3.6E-03	8.0E-02	mg/kg	54SB20B	9/24	0.0022 - 0.01	8.0E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	50-32-8	Benzo(a)pyrene	2.0E-03	4.2E-02	mg/kg	54SB20B	6/24	0.0016 - 0.01	4.2E-02	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	205-99-2	Benzo(b)fluoranthene	4.9E-03	1.1E-01	mg/kg	54SB20B	7/24	0.0017 - 0.01	1.1E-01	2.2E-01	C	3.9E+00	C	IND	N	BSL
	191-24-2	Benzo(g,h,i)perylene [9]	3.2E-02	3.2E-02	mg/kg	54SB20B	2/24	0.0036 - 0.01	3.2E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	3.7E-03	1.2E-01	mg/kg	54SB20B	7/24	0.0014 - 0.01	1.2E-01	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	4.5E-03	4.2E-02	mg/kg	54SB21A	7/24	0.0024 - 0.01	4.2E-02	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	1.6E-02	3.6E-02	mg/kg	54SB24A	3/24	0.0042 - 0.01	3.6E-02	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	206-44-0	Fluoranthene	4.8E-03	4.6E-01	mg/kg	54SB20B	19/24	0.0021 - 0.022	4.6E-01	3.1E+02	N	4.1E+03	N	IND	N	BSL
	86-73-7	Fluorene	2.6E-02	2.6E-02	mg/kg	54SB20B	1/9	0.014 - 0.014	2.6E-02	3.1E+02	N	4.1E+03	N	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	5.9E-03	1.1E-01	mg/kg	54SB24A	3/24	0.0025 - 0.01	1.1E-01	2.2E-01	C	3.9E+00	C	IND	N	BSL
	91-20-3	Naphthalene	2.3E-02	2.1E-01	mg/kg	54SB28A	7/12	0.014 - 0.049	2.1E-01	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene [9]	1.1E-02	2.7E-02	mg/kg	54SB22A (B)	4/24	0.0085 - 0.053	2.7E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	8.1E-03	3.2E-01	mg/kg	54SB20B	15/24	0.0043 - 0.022	3.2E-01	2.3E+02	N	3.1E+03	N	IND	N	BSL

Table G.1-3c
Area A COPC Determination - Total Soil - Post Removal Action
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
		Explosives														
	99-35-4	1,3,5-Trinitrobenzene	ND	ND	mg/kg	NA	0/22	--	ND	2.3E+02	N	3.1E+03	N	IND	N	NA
	118-96-7	2,4,6-Trinitrotoluene[10]	4.3E-01	4.3E-01	mg/kg	54SB34A (D)	1/45	0.051 - 0.16	4.3E-01	3.9E+00	N	5.1E+01	N	IND	N	BSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	mg/kg	NA	0/45	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	606-20-2	2,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/45	--	ND	7.8E+00	N	1.0E+02	N	IND	N	NA
	--	Dinitrotoluene Mix	ND	ND	mg/kg	NA	0/45	--	ND	9.4E-01	--	4.2E+00	--	IND	N	NA
	35572-78-2	2-Amino-4,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/45	0.088 - 1	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	1946-51-0	4-Amino-2,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/45	0.053 - 0.095	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	--	Aminodinitrotoluenes	ND	ND	mg/kg	NA	0/45	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	ND	ND	mg/kg	NA	0/45	--	ND	3.9E+02	N	5.1E+03	N	IND	N	NA
		Nitroglycerin														
	55-63-0	Nitroglycerin	ND	ND	mg/kg	NA	0/37	--	ND	7.8E-01	N	1.0E+01	N	IND	N	NA

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RBC = USEPA Region III Risk-Based Concentration
(RBC) values from the October 11, 2007,
RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
N/C = Noncarcinogenic/Carcinogenic per EPA RBC Table (October 2007)
[1] = Chromium VI RBC value was used
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[4] = Chlordane RBC value was used
[5] = Alpha-BHC RBC value was used
[6] = Endosulfan RBC value was used
[7] = Endrin RBC value was used
[8] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[9] = Pyrene RBC value was used
[10] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

(A) = Facility-Wide Background Point Estimate as Reported in the Facility-Wide Background Study Report (IT 2001a)
(B) = Re-sampled; Pesticides and PCBs analyzed January 2007.
(D) = Re-sampled; Dioxin/Furans analyzed January 2007.

USEPA = U.S. Environmental Protection Agency
ARAR = Applicable, Relevant, and Appropriate Requirement
TBC = To-Be-Considered
RDA = Recommended Daily Allowance
IND = Adjusted Industrial RBC
AL = USEPA Action Level

ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

ND = Not Detected
NA = Not Applicable

Table G.1-3d
Area A Post-Removal Action EPCs - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

DI-N-OCTYL PHTHALATE (ug/kg)

General Statistics

Number of Valid Data	11	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	6
		Percent Non-Detects	54.55%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	57	Minimum Detected	4.043
Maximum Detected	320	Maximum Detected	5.768
Mean of Detected	177.4	Mean of Detected	5.031
SD of Detected	98.48	SD of Detected	0.644
Minimum Non-Detect	380	Minimum Non-Detect	5.94
Maximum Non-Detect	400	Maximum Non-Detect	5.991

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	11
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 5 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.971	Shapiro Wilk Test Statistic	0.95
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	187.5	Mean	5.165
SD	63.08	SD	0.427
95% DL/2 (t) UCL	221.9	95% H-Stat (DL/2) UCL	412.2
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	5.031
		SD in Log Scale	0.504
		Mean in Original Scale	170.5
		SD in Original Scale	79.04
		95% Percentile Bootstrap UCL	209.3
		95% BCA Bootstrap UCL	213.1

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.558	**Data appear Normal at 5% Significance Level**	
Theta Star	113.9		
nu star	15.58		
A-D Test Statistic	0.228	**Nonparametric Statistics**	
5% A-D Critical Value	0.682	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.682	Mean	177.4
5% K-S Critical Value	0.359	SD	88.09
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	44.04
		95% KM (t) UCL	257.2
Assuming Gamma Distribution		95% KM (z) UCL	249.8
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	262.5
Minimum	57	95% KM (bootstrap t) UCL	309.4
Maximum	320	95% KM (BCA) UCL	252.5
Mean	179	95% KM (Percentile Bootstrap) UCL	250
Median	183.2	95% KM (Chebyshev) UCL	369.4
SD	78.47	97.5% KM (Chebyshev) UCL	452.4
k star	3.691	99% KM (Chebyshev) UCL	615.6
Theta star	48.49		
Nu star	81.2	**Potential UCLs to Use**	
AppChi2	61.44	95% KM (t) UCL	257.2
95% Gamma Approximate UCL	236.5	95% KM (Percentile Bootstrap) UCL	250
95% Adjusted Gamma UCL	247.8		

Note: DL/2 is not a recommended method.

Table G.1-3d
Area A Post-Removal Action EPCs - Surface Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

DIBENZO(A,H)ANTHRACENE (ug/kg)

General Statistics

Number of Valid Data	11	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	9
		Percent Non-Detects	81.82%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	16	Minimum Detected	2.773
Maximum Detected	36	Maximum Detected	3.584
Mean of Detected	26	Mean of Detected	3.178
SD of Detected	14.14	SD of Detected	0.573
Minimum Non-Detect	4.2	Minimum Non-Detect	1.435
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	9
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	81.82%

Warning: Data set has only 2 Distinct Detected Values.
This may not be adequate enough to compute meaningful and reliable test statistics and estimates.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.95	Mean	1.338
SD	10.48	SD	0.985
95% DL/2 (t) UCL	12.68	95% H-Stat (DL/2) UCL	8.38

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**
Theta Star	N/A	
nu star	N/A	
A-D Test Statistic	0.359	**Nonparametric Statistics**
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method
K-S Test Statistic	N/A	Mean 17.82
5% K-S Critical Value	N/A	SD 5.75
Data not Gamma Distributed at 5% Significance Level		SE of Mean 2.452
		95% KM (t) UCL 22.26
Assuming Gamma Distribution		95% KM (z) UCL 21.85
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL 31.62
Minimum	N/A	95% KM (bootstrap t) UCL 1.798E+308
Maximum	N/A	95% KM (BCA) UCL 36
Mean	N/A	95% KM (Percentile Bootstrap) UCL 36
Median	N/A	95% KM (Chebyshev) UCL 28.5
SD	N/A	97.5% KM (Chebyshev) UCL 33.13
k star	N/A	99% KM (Chebyshev) UCL 42.21
Theta star	N/A	
Nu star	N/A	**Potential UCLs to Use**
AppChi2	N/A	95% KM (t) UCL 22.26
95% Gamma Approximate UCL	N/A	95% KM (% Bootstrap) UCL 36
95% Adjusted Gamma UCL	N/A	

Note: DL/2 is not a recommended method.

Table G.1-3d
Area A Post-Removal Action EPCs - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammuition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

DI-N-OCTYL PHTHALATE (ug/kg)

General Statistics

Number of Valid Data	24	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	16
		Percent Non-Detects	66.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	35	Minimum Detected	3.555
Maximum Detected	320	Maximum Detected	5.768
Mean of Detected	158	Mean of Detected	4.769
SD of Detected	113	SD of Detected	0.879
Minimum Non-Detect	380	Minimum Non-Detect	5.94
Maximum Non-Detect	420	Maximum Non-Detect	6.04

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	24
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 8 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.896	Shapiro Wilk Test Statistic	0.894
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	186.6	Mean	5.125
SD	65.9	SD	0.55
95% DL/2 (t) UCL	209.7	95% H-Stat (DL/2) UCL	345.2
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	4.769
		SD in Log Scale	0.726
		Mean in Original Scale	149
		SD in Original Scale	99.58
		95% Percentile Bootstrap UCL	181.7
		95% BCA Bootstrap UCL	185.1

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.242	**Data appear Normal at 5% Significance Level**	
Theta Star	127.2		
nu star	19.87		
A-D Test Statistic	0.382	**Nonparametric Statistics**	
5% A-D Critical Value	0.725	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.725	Mean	158
5% K-S Critical Value	0.298	SD	105.7
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	39.96
		95% KM (t) UCL	226.5
Assuming Gamma Distribution		95% KM (z) UCL	223.7
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	229.7
Minimum	9.586	95% KM (bootstrap t) UCL	246.5
Maximum	320	95% KM (BCA) UCL	223
Mean	158.9	95% KM (Percentile Bootstrap) UCL	224.1
Median	156.3	95% KM (Chebyshev) UCL	332.2
SD	95.7	97.5% KM (Chebyshev) UCL	407.6
k star	1.723	99% KM (Chebyshev) UCL	555.6
Theta star	92.24		
Nu star	82.7	**Potential UCLs to Use**	
AppChi2	62.75	95% KM (t) UCL	226.5
95% Gamma Approximate UCL	209.5	95% KM (Percentile Bootstrap) UCL	224.1
95% Adjusted Gamma UCL	213.6		

Note: DL/2 is not a recommended method.

Table G.1-3d
Area A Post-Removal Action EPCs - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammuition Plant, Radford, Virginia

BENZO(A)PYRENE (ug/kg)

General Statistics

Number of Valid Data	24	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	18
		Percent Non-Detects	75.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2	Minimum Detected	0.693
Maximum Detected	42	Maximum Detected	3.738
Mean of Detected	13.12	Mean of Detected	1.971
SD of Detected	15.55	SD of Detected	1.215
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	10	Maximum Non-Detect	2.303
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	22
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	91.67%

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.788	Shapiro Wilk Test Statistic	0.921
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	4.744	Mean	0.705
SD	8.925	SD	1.183
95% DL/2 (t) UCL	7.866	95% H-Stat (DL/2) UCL	5.664
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-0.906
		SD in Log Scale	2.203
		Mean in Original Scale	3.544
		SD in Original Scale	9.198
		95% Percentile Bootstrap UCL	6.79
		95% BCA Bootstrap UCL	8.439

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.592	**Data appear Normal at 5% Significance Level**	
Theta Star	22.15		
nu star	7.105		
A-D Test Statistic	0.379	**Nonparametric Statistics**	
5% A-D Critical Value	0.716	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.716	Mean	4.875
5% K-S Critical Value	0.341	SD	8.578
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.927
		95% KM (t) UCL	8.177
Assuming Gamma Distribution		95% KM (z) UCL	8.044
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	7.666
Minimum	1E-09	95% KM (bootstrap t) UCL	12.75
Maximum	175.5	95% KM (BCA) UCL	13.74
Mean	50.82	95% KM (Percentile Bootstrap) UCL	9.167
Median	38.45	95% KM (Chebyshev) UCL	13.27
SD	50.51	97.5% KM (Chebyshev) UCL	16.91
k star	0.373	99% KM (Chebyshev) UCL	24.04
Theta star	136.3		
Nu star	17.89	**Potential UCLs to Use**	
AppChi2	9.313	95% KM (t) UCL	8.177
95% Gamma Approximate UCL	97.63	95% KM (Percentile Bootstrap) UCL	9.167
95% Adjusted Gamma UCL	102.4		

Note: DL/2 is not a recommended method.

Table G.1-3d
Area A Post-Removal Action EPCs - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammuition Plant, Radford, Virginia

DIBENZO(A,H)ANTHRACENE

General Statistics

Number of Valid Data	24	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	21
		Percent Non-Detects	87.50%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	16	Minimum Detected	2.773
Maximum Detected	36	Maximum Detected	3.584
Mean of Detected	27.33	Mean of Detected	3.252
SD of Detected	10.26	SD of Detected	0.425
Minimum Non-Detect	4.2	Minimum Non-Detect	1.435
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	21
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	3
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	87.50%

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.949	Shapiro Wilk Test Statistic	0.908
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.848	Mean	1.234
SD	8.906	SD	0.863
95% DL/2 (t) UCL	8.964	95% H-Stat (DL/2) UCL	5.612

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	1.06
		SD in Log Scale	1.243
		Mean in Original Scale	6.147
		SD in Original Scale	9.082
		95% Percentile Bootstrap UCL	9.237
		95% BCA Bootstrap UCL	10.37

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**
Theta Star	N/A	
nu star	N/A	

A-D Test Statistic	0.357	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	17.42
5% K-S Critical Value	N/A	SD	4.778
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.194
		95% KM (t) UCL	19.46
Assuming Gamma Distribution		95% KM (z) UCL	19.38
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	26.34
Minimum	N/A	95% KM (bootstrap t) UCL	18.18
Maximum	N/A	95% KM (BCA) UCL	N/A
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	22.62
SD	N/A	97.5% KM (Chebyshev) UCL	24.88
k star	N/A	99% KM (Chebyshev) UCL	29.3
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	19.46
95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	N/A
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table G.1-3e
EPCs including Soil-to-Groundwater Remedial Goals, Residual Soil EPCs, and Grounwater for Beneficial Reuse Remedial Goals
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Soil Analyte Surface Soil	CAS	EPC (mg/kg)	Soil Analyte Total Soil	CAS	EPC (mg/kg)	Groundwater Analyte	CAS	EPC (ug/L)
Heptachlor epoxide	1024-57-3	0.0047	Heptachlor epoxide	1024-57-3	0.0047	Cobalt	7440-36-0	2.4
Di-n-octylphthalate	117-84-0	0.257	Di-n-octylphthalate	117-84-0	0.227	Manganese	7439-96-5	190.5
Dibenz(a,h)anthracene	53-70-3	0.0223	Benzo(a)pyrene	50-32-8	0.00818	2,4,6-Trinitrotoluene	118-96-7	7.82
2,4,6-Trinitrotoluene	118-96-7	1.7	Dibenz(a,h)anthracene	53-70-3	0.0195	Dinitrotoluene Mix	--	0.932
Aminodinitrotoluene	---	1.095	Aminodinitrotoluene	---	1.095	4-Nitrotoluene	99-99-0	0.94
2,4-Dinitrotoluene	121-14-2	0.022	2,4,6-Trinitrotoluene	118-96-7	1.7	RDX	121-82-4	6.1
2,6-Dinitrotoluene	606-20-2	0.022	2,4-Dinitrotoluene	121-14-2	0.022	Perchlorate	14797-73-0	10.9
Dinitrotoluene Mix	--	0.044	2,6-Dinitrotoluene	606-20-2	0.022			
2,3,7,8-TCDD TEQ	1746-01-6	7.89E-06	Dinitrotoluene Mix	--	0.044			
			Nitroglycerin	55-63-0	0.069			
			2,3,7,8-TCDD TEQ	1746-01-6	7.89E-06			

Notes:

CAS = Chemical Abstract System
EPC = Exposure Point Concentration
= Remedial Goal
= Residual Soil EPC
= Groundwater MDC
mg/kg = milligam per kilogram
ug/L = microgram per liter

Table G.1-3f
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Maintenance Worker
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Heptachlor epoxide	3.E-09	--	1.E-09	4.E-09	Heptachlor epoxide	liver	7.E-05	--	2.E-05	9.E-05
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	1.E-06	--	4.E-07	2.E-06
			Dibenz(a,h)anthracene	1.E-08	--	5.E-09	2.E-08	Dibenz(a,h)anthracene	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	liver	1.E-04	--	2.E-06	1.E-04
			2,4,6-Trinitrotoluene	2.E-09	--	2.E-10	2.E-09	2,4,6-Trinitrotoluene	liver	4.E-04	--	4.E-05	5.E-04
			2,4,6-Trinitrotoluene	2.E-09	--	2.E-10	2.E-09	2,4,6-Trinitrotoluene	liver	4.E-04	--	4.E-05	5.E-04
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	9.E-07	--	3.E-07	1.E-06
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	CNS/ blood/ liver	2.E-06	--	6.E-07	2.E-06
			Dinitrotoluene Mix	--	--	3.E-11	3.E-11	Dinitrotoluene Mix	--	--	--	--	--
			2,3,7,8-TCDD TEQ	--	--	8.E-09	8.E-09	2,3,7,8-TCDD TEQ	--	--	--	--	--
				2.E-08	--	1.E-08	3.E-08			1.0.E-03	--	1.1.E-04	1.E-03
	Air	Air (Fugitive Dust)	Heptachlor epoxide	--	3.E-13	--	3.E-13	Heptachlor epoxide	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	--	--	--	--	--
			2,3,7,8-TCDD TEQ	--	7.E-12	--	7.E-12	2,3,7,8-TCDD TEQ	NA	--	--	--	--
				--	8.E-12	--	8.E-12			--	--	--	--
						Total Risk Across Soil	3.E-08					Total Hazard Index Across Soil	1.E-03

Total Risk Across All Media and All Exposure Routes	3.E-08
Total Hazard Index Across All Media and All Exposure Routes	1.E-03

Total blood HI across all media =	4.E-06
Total CNS HI across all media =	4.E-06
Total liver HI across all media =	1.E-03
Total thyroid HI across all media =	2.E-06

Table G.1-3g
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Commercial Worker
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Heptachlor epoxide	7.E-09	--	5.E-09	1.E-08	Heptachlor epoxide	liver	2.E-04	--	1.E-04	3.E-04
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	3.E-06	--	2.E-06	5.E-06
			Benzo(a)pyrene	1.E-08	--	9.E-09	2.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthracene	2.E-08	--	2.E-08	5.E-08	Dibenz(a,h)anthracene	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	liver	3.E-04	--	1.E-05	3.E-04
			2,4,6-Trinitrotoluene	6.E-09	--	1.E-09	7.E-09	2,4,6-Trinitrotoluene	liver	1.E-03	--	2.E-04	1.E-03
			2,4,6-Trinitrotoluene	6.E-09	--	1.E-09	7.E-09	2,4,6-Trinitrotoluene	liver	1.E-03	--	2.E-04	1.E-03
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	2.E-06	--	1.E-06	4.E-06
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	CNS/ blood/ liver	4.E-06	--	3.E-06	7.E-06
			Dinitrotoluene Mix	2.E-09	--	1.E-10	2.E-09	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	2.E-10	--	1.E-11	2.E-10	Nitroglycerin	vascular	3.E-04	--	2.E-05	4.E-04
			2,3,7,8-TCDD TEQ	2.E-07	--	4.E-08	2.E-07	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	3.E-07	--	8.E-08	3.E-07	Total		3.E-03	--	6.E-04	3.E-03
	Air	Air (Fugitive Dust)	Heptachlor epoxide	--	2.E-12	--	2.E-12	Heptachlor epoxide	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)pyrene	--	1.E-12	--	1.E-12	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	5.E-11	--	5.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	5.E-11	--	5.E-11	Total		--	--	--	--
Groundwater	Groundwater	Groundwater used as tapwater	Cobalt	--	--	--	--	Cobalt	blood	6.E-02	--	3.E-04	6.E-02
			Manganese	--	--	--	--	Manganese	CNS	9.E-02	--	2.E-03	1.E-01
			2,4,6-Trinitrotoluene	8.2.E-07	--	3.E-09	8.2.E-07	2,4,6-Trinitrotoluene	liver	2.E-01	--	5.E-04	2.E-01
			Dinitrotoluene Mix	2.2.E-06	--	2.E-08	2.2.E-06	Dinitrotoluene Mix	NA	--	--	--	--
			4-Nitrotoluene	--	--	--	--	4-Nitrotoluene	NA	--	--	--	--
			RDX	2.3.E-06	--	--	2.3.E-06	RDX	prostate	2.E-02	--	--	2.E-02
			Perchlorate	--	--	--	--	Perchlorate	thyroid	2.E-01	--	1.E-04	2.E-01
			Total	5.E-06	--	2.E-08	5.E-06	Total		5.E-01	--	3.E-03	5.E-01
							Total Risk Across Soil						3.E-07
							Total Risk Across Groundwater						5.E-06
							Total Risk Across All Media and All Exposure Routes						6.E-06
												Total Hazard Index Across Soil	3.E-03
												Total Hazard Index Across Groundwater	5.E-01
												Total Hazard Index Across All Media and All Exposure Routes	5.E-01

Total blood HI across all media =	6.E-02
Total CNS HI across all media =	1.E-01
Total liver HI across all media =	2.E-01
Total vascular HI across all media =	4.E-04
Total prostate HI across all media =	2.E-02
Total thyroid HI across all media =	2.E-01

Table G.1-3h
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Construction Worker
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Heptachlor epoxide	2.E-09	--	6.E-10	3.E-09	Heptachlor epoxide	liver	1.E-03	--	3.E-04	2.E-03
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	2.E-06	--	5.E-07	2.E-06
			Benzo(a)pyrene	3.E-09	--	1.E-09	4.E-09	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthracene	7.E-09	--	3.E-09	9.E-09	Dibenz(a,h)anthracene	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	liver	2.E-03	--	3.E-05	2.E-03
			2,4,6-Trinitrotoluene	1.E-09	--	1.E-10	2.E-09	2,4,6-Trinitrotoluene	liver	7.E-03	--	6.E-04	8.E-03
			2,4,6-Trinitrotoluene	1.E-09	--	1.E-10	2.E-09	2,4,6-Trinitrotoluene	liver	7.E-03	--	6.E-04	8.E-03
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	1.E-05	--	4.E-06	2.E-05
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	CNS/ blood/ liver	3.E-06	--	9.E-07	4.E-06
			Dinitrotoluene Mix	6.E-10	--	2.E-11	6.E-10	Dinitrotoluene Mix	--	--	--	--	--
			Nitroglycerin	5.E-11	--	2.E-12	6.E-11	Nitroglycerin	vascular	2.E-03	--	7.E-05	2.E-03
			2,3,7,8-TCDD TEQ	5.E-08	--	5.E-09	6.E-08	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	7.E-08	--	9.E-09	8.E-08	Total		2.E-02	--	2.E-03	2.E-02
	Air	Air (Fugitive Dust)	Heptachlor epoxide	--	1.E-10	--	1.E-10	Heptachlor epoxide	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)pyrene	--	6.E-11	--	6.E-11	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthracene	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	3.E-09	--	3.E-09	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	3.E-09	--	3.E-09	Total		--	--	--	--
Groundwater	Groundwater	Groundwater	Cobalt	--	--	--	--	Cobalt	blood	1.E-03	--	5.E-03	6.E-03
			Manganese	--	--	--	--	Manganese	CNS	9.E-04	--	2.E-02	2.E-02
			2,4,6-Trinitrotoluene	3.E-10	--	4.E-10	7.8.E-10	2,4,6-Trinitrotoluene	liver	2.E-03	--	2.E-03	4.E-03
			4-Nitrotoluene	--	--	--	--	4-Nitrotoluene	NA	--	--	--	--
			RDX	9.E-10	--	1.E-10	1.0.E-09	RDX	prostate	2.E-04	--	9.E-05	3.E-04
			Perchlorate	--	--	--	--	Perchlorate	thyroid	2.E-03	--	1.E-03	3.E-03
			Total	1.E-09	--	6.E-10	2.E-09	Total		5.E-03	--	2.E-02	3.E-02
							Total Risk Across Soil	8.E-08					Total Hazard Index Across Soil	2.E-02
							Total Risk Across Groundwater	2.E-09					Total Hazard Index Across Groundwater	3.E-02
							Total Risk Across All Media and All Exposure Routes	8.E-08					Total Hazard Index Across All Media and All Exposure Routes	5.E-02

Total blood HI across all media =	6.E-03
Total CNS HI across all media =	2.E-02
Total liver HI across all media =	2.E-02
Total vascular HI across all media =	2.E-03
Total prostate HI across all media =	3.E-04
Total thyroid HI across all media =	3.E-03

Table G.1-3i
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Adult Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Heptachlor epoxide	2.E-08	--	8.E-09	3.E-08	Heptachlor epoxide	liver	5.E-04	--	2.E-04	7.E-04
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	8.E-06	--	3.E-06	1.E-05
			Benzo(a)pyrene*	5.E-08	--	3.E-08	8.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthracene*	1.E-07	--	6.E-08	2.E-07	Dibenz(a,h)anthracene	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Dibenz(a,h)anthracene	liver	8.E-04	--	2.E-05	8.E-04
			2,4,6-Trinitrotoluene	2.E-08	--	2.E-09	2.E-08	Dibenz(a,h)anthracene	liver	3.E-03	--	4.E-04	3.E-03
			2,4,6-Trinitrotoluene	2.E-08	--	2.E-09	2.E-08	2,4,6-Trinitrotoluene	liver	3.E-03	--	4.E-04	3.E-03
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	6.E-06	--	2.E-06	9.E-06
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	CNS/ blood/ liver	1.E-05	--	5.E-06	2.E-05
			Dinitrotoluene Mix	6.E-09	--	2.E-10	6.E-09	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	6.E-10	--	2.E-11	6.E-10	Nitroglycerin	vascular	9.E-04	--	4.E-05	1.E-03
			2,3,7,8-TCDD TEQ	6.E-07	--	7.E-08	6.E-07	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	8.E-07	--	2.E-07	9.E-07	Total		8.E-03	--	1.E-03	9.E-03
	Air	Air (Fugitive Dust)	Heptachlor epoxide	--	4.E-13	--	4.E-13	Heptachlor epoxide	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)pyrene*	--	4.E-13	--	4.E-13	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthracene*	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	1.E-11	--	1.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	1.E-11	--	1.E-11	Total		--	--	--	--
Groundwater	Groundwater	Groundwater used as tapwater	Cobalt	--	--	--	--	Cobalt	blood	2.E-01	--	6.E-03	2.E-01
			Manganese	--	--	--	--	Manganese	CNS	3.E-01	--	3.E-02	3.E-01
			2,4,6-Trinitrotoluene	2.E-06	--	6.E-08	2.E-06	2,4,6-Trinitrotoluene	liver	4.E-01	--	1.E-02	4.E-01
			Dinitrotoluene Mix	6.E-06	--	4.E-07	6.E-06	Dinitrotoluene Mix	NA	--	--	--	--
			4-Nitrotoluene	--	--	--	--	4-Nitrotoluene	NA	--	--	--	--
			RDX	6.E-06	--	2.E-08	6.E-06	RDX	prostate	6.E-02	--	5.E-04	6.E-02
			Perchlorate	--	--	--	--	Perchlorate	thyroid	4.E-01	--	2.E-03	4.E-01
			Total	1.4.E-05	--	4.E-07	1.5.E-05	Total		1.3.E+00	--	5.E-02	1.E+00
							Total Risk Across Soil	9.E-07					Total Hazard Index Across Soil	9.E-03
							Total Risk Across Groundwater	1.E-05					Total Hazard Index Across Groundwater	1.E+00
							Total Risk Across All Media and All Exposure Routes	2.E-05					Total Hazard Index Across All Media and All Exposure Routes	1.E+00

Total blood HI across all media =	2.E-01
Total CNS HI across all media =	3.E-01
Total liver HI across all media =	4.E-01
Total vascular HI across all media =	1.E-03
Total prostate HI across all media =	6.E-02
Total thyroid HI across all media =	4.E-01

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with USEPA Region III ADAF Guidance (11/08/2006).

Table G.1-3j
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Child Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Heptachlor epoxide	5.E-08	--	1.E-08	6.E-08	Heptachlor epoxide	liver	5.E-03	--	1.E-03	6.E-03
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	liver/thyroid	7.E-05	--	2.E-05	9.E-05
			Benzo(a)pyrene*	3.E-07	--	1.E-07	5.E-07	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthracene*	8.E-07	--	3.E-07	1.E-06	Dibenz(a,h)anthracene	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Dibenz(a,h)anthracene	liver	7.E-03	--	1.E-04	7.E-03
			2,4,6-Trinitrotoluene	4.E-08	--	3.E-09	4.E-08	Dibenz(a,h)anthracene	liver	3.E-02	--	2.E-03	3.E-02
			2,4,6-Trinitrotoluene	4.E-08	--	3.E-09	4.E-08	2,4,6-Trinitrotoluene	liver	3.E-02	--	2.E-03	3.E-02
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	6.E-05	--	2.E-05	7.E-05
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	CNS/ blood/ liver	1.E-04	--	3.E-05	1.E-04
			Dinitrotoluene Mix	1.E-08	--	4.E-10	1.E-08	Dinitrotoluene Mix	NA	--	--	--	--
			Nitroglycerin	1.E-09	--	4.E-11	1.E-09	Nitroglycerin	vascular	9.E-03	--	2.E-04	9.E-03
			2,3,7,8-TCDD TEQ	1.E-06	--	1.E-07	1.E-06	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	3.E-06	--	6.E-07	3.E-06	Total		8.E-02	--	6.E-03	8.E-02
	Air	Air (Fugitive Dust)	Heptachlor epoxide	--	1.E-12	--	1.E-12	Heptachlor epoxide	NA	--	--	--	--
			Di-n-octylphthalate	--	--	--	--	Di-n-octylphthalate	NA	--	--	--	--
			Benzo(a)pyrene*	--	3.E-12	--	3.E-12	Benzo(a)pyrene	NA	--	--	--	--
			Dibenz(a,h)anthracene*	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	Dibenz(a,h)anthracene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--	2,6-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	--	--	--	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	4.E-12	--	4.E-12	Total		--	--	--	--
Groundwater	Groundwater	Groundwater used as tapwater	Cobalt	--	--	--	--	Cobalt	blood	4.E-01	--	2.E-02	4.E-01
			Manganese	--	--	--	--	Manganese	CNS	6.E-01	--	1.E-01	7.E-01
			2,4,6-Trinitrotoluene	1.E-06	--	4.E-08	1.E-06	2,4,6-Trinitrotoluene	liver	1.E+00	--	3.E-02	1.E+00
			Dinitrotoluene Mix	3.E-06	--	2.E-07	4.E-06	Dinitrotoluene Mix	NA	--	--	--	--
			4-Nitrotoluene	--	--	--	--	4-Nitrotoluene	NA	--	--	--	--
			RDX	4.E-06	--	9.E-09	4.E-06	RDX	prostate	1.E-01	--	1.E-03	1.E-01
			Perchlorate	--	--	--	--	Perchlorate	thyroid	1.E+00	--	7.E-03	1.E+00
			Total	8.E-06	--	3.E-07	9.E-06	Total		3.E+00	--	2.E-01	3.E+00
						Total Risk Across Soil	3.E-06					Total Hazard Index Across Soil	8.E-02
						Total Risk Across Groundwater	9.E-06					Total Hazard Index Across Groundwater	3.E+00
						Total Risk Across All Media and All Exposure Routes	1.E-05					Total Hazard Index Across All Media and All Exposure Routes	3.E+00

Total blood HI across all media =	4.E-01
Total CNS HI across all media =	7.E-01
Total liver HI across all media =	1.E+00
Total vascular HI across all media =	9.E-03
Total prostate HI across all media =	1.E-01
Total thyroid HI across all media =	1.E+00

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated accordance with USEPA Region III ADAF Guidance (11/08/2006).

Table G.1-3k
Summary of Cancer Risks for COPCs - Residual Risk - Lifetime Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Heptachlor epoxide	7.E-08	--	2.E-08	9.E-08
			Di-n-octylphthalate	--	--	--	--
			Benzo(a)pyrene*	4.E-07	--	2.E-07	6.E-07
			Dibenz(a,h)anthracene*	1.E-06	--	4.E-07	1.E-06
			2,4,6-Trinitrotoluene	5.E-08	--	5.E-09	6.E-08
			2,4-Dinitrotoluene	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--
			Dinitrotoluene Mix	2.E-08	--	6.E-10	2.E-08
			Nitroglycerin	2.E-09	--	6.E-11	2.E-09
			2,3,7,8-TCDD TEQ	2.E-06	--	2.E-07	2.E-06
			Total	3.E-06	--	7.E-07	4.E-06
	Air	Air (Fugitive Dust)	Heptachlor epoxide	--	4.E-13	--	4.E-13
			Di-n-octylphthalate	--	--	--	--
			Benzo(a)pyrene*	--	--	--	--
			Dibenz(a,h)anthracene*	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--
			2,6-Dinitrotoluene	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--
			Nitroglycerin	--	--	--	--
			2,3,7,8-TCDD TEQ	--	4.E-11	--	4.E-11
			Total	--	4.E-11	--	4.E-11
Groundwater	Groundwater	Groundwater used as tapwater	Cobalt	--	--	--	--
			Manganese	--	--	--	--
			2,4,6-Trinitrotoluene	3.E-06	--	1.E-07	4.E-06
			Dinitrotoluene Mix	9.E-06	--	6.E-07	1.E-05
			4-Nitrotoluene	--	--	--	--
			RDX	1.E-05	--	2.E-08	1.E-05
			Perchlorate	--	--	--	--
			Total	2.E-05	--	7.E-07	2.E-05
						Total Risk Across Soil	4.E-06
						Total Risk Across Groundwater	2.4.E-05

Total Risk Across All Media and All Exposure Routes	3.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated accordance with USEPA Region III ADAF Guidance (11/08/2006).

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APPENDIX G.2

AREA B REMEDIAL GOALS

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Table G.2-1a
Remedial Goal Calculation Equations - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Remedial Goal Equations used for Soil

Ingestion
Noncarcinogens

$$RG_o = \frac{THQ*BW*AT\text{-}N*RfD_o}{EF*ED*IR\text{-}S*FI*CF_1}$$

Dermal
Noncarcinogens

$$RG_d = \frac{THQ*BW*AT\text{-}N*RfD_d}{SA*AF*ABS_d*EF*ED*CF_1}$$

Inhalation
Noncarcinogens

$$RG_i = \frac{THQ*BW*AT\text{-}N*RfD_i}{EF*ED*IR\text{-}A*ET*(1/VF+1/PEF)}$$

Overall Remedial Goal Equation

$$RG = \frac{1}{(1/RG_o + 1/RG_d + 1/RG_i)}$$

NOTES:

RG =	remedial goal soil	mg/kg
THQ =	target hazard quotient	unitless

Receptor specific parameters provided in Appendix E.2, Table E.2-4.1c (oral and dermal) and Table E.2-4.1d (inhalation)

BW =	body weight (receptor specific - kg)	kg
AT-N =	averaging time (receptor specific)	days
EF =	exposure frequency (receptor specific)	days/year
ED =	exposure duration (receptor specific)	years
ET =	exposure time (receptor specific)	hours/day
EV =	event frequency (receptor specific)	events/day
IR-S =	ingestion rate -soil (receptor specific)	mg/day
IR-A =	inhalation rate (receptor specific)	m^3/hour
SA =	skin surface contact area (receptor specific)	cm^2
AF =	adherence factor (receptor specific)	mg/cm^2

Table G.2-1a
Remedial Goal Calculation Equations - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

NOTES CONTINUED:

Toxicity Data provided in Appendix E.2, Tables E.2-5.1 and E.2-5.2

RfD_o =	oral reference dose (see Table E.2-5.1)	mg/kg-day
RfD_d =	dermal reference dose (see Table E.2-5.1)	mg/kg-day
RfD_i =	inhalation reference dose (see Table E.2-5.2)	mg/kg-day

Additional parameters used for soil calculations provided in Appendix E.2

FI =	fraction ingested (1.0)	unitless
ABS_d =	absorption factor (see Table E.2-4.3)	unitless
VF =	volatilization factor (see Table E.2-4.3)	m^3/kg
PEF =	particulate emission factor (see Table E.2-4.4)	m^3/kg
CF_1 =	conversion factor (1E-06)	kg/mg
CF_2 =	conversion factor (1E-03)	cm^3/L
CF_3 =	conversion factor (1E-03)	mg/ug

Table G.2-1b
Noncarcinogenic Remedial Goal Calculation - Soil - Child Resident - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammuntion Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Soil
Receptor:	Child Resident

	INGESTION		DERMAL		INGESTION/DERMAL	INHALATION		Noncarcinogenic Remedial Goal Calculation							
												Noncancer RG (mg/kg)			
Chemical	CAS Number	RfDo (mg/kg-day)	RfDd (mg/kg-day)	ABSd	Ingestion/Dermal Target Organ	RfD (mg/kg-day)	Inhalation Target Organ	VF	PEF	(1/VF+1/PEF)	THQ	RGo	RGd	RGi	RG
2,4,6-TNT	118-96-7	5.00E-04	5.00E-04	3.00E-02	liver	--	--	--	6.70E+08	1.49E-09	1.E+00	3.91E+01	4.66E+02	--	3.61E+01
Nitroglycerin	55-63-0	1.00E-04	1.00E-04	1.00E-02	vascular	--	--	--	6.70E+08	1.49E-09	1.E+00	7.82E+00	2.79E+02	--	7.61E+00

Notes:
See Table G.2-1a for Remedial Goal Equations and acronyms

Table G.2-2a
Soil-to-Groundwater RG for 2,4,6-Trinitrotoluene using RG_{gw} from Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
RG_{gw}	GW Concentration Source=	0.00782	mg/L
C_w =	Target Leachate Conc =	0.0782	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.870E-05	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1834	L/kg

$$RG_{soil\text{-}to\text{-}gw}\ (mg/kg) = C_w [K_d + (\theta_w + \theta_a H')/P_b]$$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.34	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**1.45**	**mg/kg**

Table G.2-2b
Soil-to-Groundwater RG for DNT Mixture (50% 2,4-DNT , 50% 2,6-DNT) using RG_{gw} from Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
RG_{gw}	GW Concentration Source=	0.000932	mg/L
C_w =	Target Leachate Conc =	0.00932	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.620E-05	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	371	L/kg

$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	3.714	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.037**	**mg/kg**

Table G.2-2c
Soil-to-Groundwater RG for RDX using RG_{gw} from Area A
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
RG_{gw}/T-RBC	GW Concentration Source=	0.0061	mg/L
C_w =	Target Leachate Conc =	0.061	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.580E-06	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	195.4	L/kg
	$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.954	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.134**	**mg/kg**

Table G.2-2d
Soil-to-Groundwater RG for Aminodinitrotoluenes using T-RBC
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.073	mg/L
C_w =	Target Leachate Conc =	0.73	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.610E-10	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	101	L/kg

$SSL_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.005	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.912**	**mg/kg**

Table G.2-2e
Soil-to-Groundwater RG for Nitroglycerin using T-RBC
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.0037	mg/L
C_w =	Target Leachate Conc =	0.037	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.040E-07	--
P_b =	Dry Soil Bulk Density =	1.35	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	130.8	L/kg

$$RG_{soil\text{-}to\text{-}gw}\,(mg/kg) = C_w\,[K_d + (\theta_w + \theta_a H')/Pb]$$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.308	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.057**	**mg/kg**

Table G.2-2f
Soil-to-Groundwater RG for Aroclor 1254 using T-RBC
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	3.35E-05	mg/L
C_w =	Target Leachate Conc =	3.35E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	1.160E-02	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	7.56E+04	L/kg

$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	756	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.25**	**mg/kg**

Table G.2-2g
Soil-to-Groundwater RG for Heptachlor Epoxide using T-RBC
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	7.40E-06	mg/L
C_w =	Target Leachate Conc =	7.40E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	8.590E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	5.26E+03	L/kg

$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	52.6	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.0039**	**mg/kg**

Table G.2-2h
Soil-to-Groundwater RG for Dieldrin using T-RBC
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	4.20E-06	mg/L
C_w =	Target Leachate Conc =	4.20E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	4.09E-04	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.06E+04	L/kg

$RG_{soil\text{-}to\text{-}gw}$ (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	106	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**0.00446**	**mg/kg**

Table G.2-2i
Soil-to-Groundwater RG for 2,3,7,8-TCDD TEQ using T-RBC
SWMU 54 RFI/CMS Report
Radford Army Ammunition Report, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	4.50E-10	mg/L
C_w =	Target Leachate Conc =	4.50E-09	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.03	--
H' =	Henry's Law Constant =	2.040E-03	--
P_b =	Dry Soil Bulk Density =	1.5	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.46E+05	L/kg

$$RG_{soil\text{-}to\text{-}gw}\,(mg/kg) = C_w\,[K_d + (\theta_w + \theta_a H')/Pb]$$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1460	L/kg
$RG_{soil\text{-}to\text{-}gw}$ =		**6.57E-06**	**mg/kg**

Table G.2-3a
Sample Assemblages Surface and Subsurface Soil for Residual Soil COPC Screening - Area B
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Area B				
Surface Soil Samples for Post-Remedial Action Residual Risk Assessment				
54SB39A	54SB47A	54SB54A	54SB77A	
54SB40A	54SB50A	54SB71A	54SB78A	
54SB41A	54SB51A	54SB73A	54SB79A	
54SB44A	54SB52A	54SB74A	54SB80A	
54SB45A	54SB53A	54SB75A		
Subsurface Soil Samples for Post-Remedial Action Residual Risk Assessment				
54SB39B	54SB51B	54SB78B	54SB49C	54SB78C
54SB40B	54SB52B	54SB79B	54SB50C	54SB79C
54SB41B	54SB53B	54SB80B	54SB53C	54SB80C
54SB43B	54SB54B	54SB39C	54SB54C	
54SB44B	54SB71B	54SB40C	54SB71C	
54SB45B	54SB72B	54SB41C	54SB72C	
54SB47B	54SB73B	54SB42C	54SB73C	
54SB48B	54SB74B	54SB43C	54SB74C	
54SB49B	54SB75B	54SB45C	54SB75C	
54SB50B	54SB77B	54SB47C	54SB77C	
Samples Collected at a Depth >15' Excluded from HHRA				
54DB44C				
54SB51C				
Samples Removed Due to Remedial Action				
54SB42A	54SB46A	54SB48A	54SB55B	
54SB42B	54SB46B	54SB49A	54SB72A	
54SB43A	54SB46C	54SB55A	54SB76C	

Table G.2-3b
Area B COPC Determination - Surface Soil - Post Removal Action
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Surface Soil		**TAL Metals**														
	7429-90-5	Aluminum	8,690	17,300	mg/kg	54SB39A (D)	11/11	2.3 - 7.1	17,300	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.44	0.57	mg/kg	54SB52A	4/10	0.14 - 0.49	0.57	3.13	N	40.88	N	IND	N	BSL
	7440-38-2	Arsenic	0.44	2	mg/kg	54SB52A	11/11	0.27 - 0.38	2	0.426	C	1.91	C	IND	Y	***ARES/IND***
	7440-39-3	Barium	91.9	241	mg/kg	54SB51A	11/11	0.02 - 0.04	241	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.61	1.1	mg/kg	54SB51A	11/11	0.01 - 0.03	1.1	15.64	N	204.4	N	IND	N	BSL
	7440-43-9	Cadmium	ND	ND	mg/kg	NA	0/11	--	ND	7.821	N	102.2	N	IND	N	NA
	7440-70-2	Calcium	636	1,680	mg/kg	54SB47A DUP AVG (D)	11/11	1 - 1.9	1,680	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium [1]	14.8	24.1	mg/kg	54SB39A (D)	11/11	0.06 - 0.1	24.1	23.46	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	6.5	12	mg/kg	54SB39A (D)	11/11	0.06 - 0.09	12	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	3.3	20.9	mg/kg	54SB53A (D)	11/11	0.15 - 0.19	20.9	312.9	N	4,088	N	IND	N	BSL
	7439-89-6	Iron	13,200	26,000	mg/kg	54SB52A	11/11	1.4 - 1.8	26,000	5,475	N	71,540	N	IND	Y	**ARES**
	7439-92-1	Lead [2]	7.4	76	mg/kg	54SB53A (D)	11/11	0.14 - 0.3	76	400	--	750	--	USEPA	N	BSL
	7439-95-4	Magnesium	1,120	4,470	mg/kg	54SB39A (D)	11/11	0.65 - 1.5	4,470	--	--	156,400	--	RDA	N	BSL
	7439-96-5	Manganese	370	767	mg/kg	54SB41A (D)	11/11	0.02 - 0.03	767	156.4	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury [3]	0.02	0.12	mg/kg	54SB53A (D)	11/11	0.018 - 0.022	0.12	2.3	--	31	--	IND	N	BSL
	7440-02-0	Nickel	7	14.3	mg/kg	54SB47A DUP AVG (D)	11/11	0.11 - 0.13	14.3	156.4	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	749	2,220	mg/kg	54SB45A (D)	11/11	4.5 - 15.7	2,220	--	--	2,607,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.56	1.8	mg/kg	54SB51A	11/11	0.34 - 0.44	1.8	39.11	N	511	N	IND	N	BSL
	7440-22-4	Silver	ND	ND	mg/kg	NA	0/11	--	ND	39.11	N	511	N	IND	N	NA
	7440-23-5	Sodium	67.6	244	mg/kg	54SB52A	11/11	26.6 - 38.3	244	--	--	625,700	--	RDA	N	BSL
	7440-62-2	Vanadium	23	54.6	mg/kg	54SB52A	11/11	0.07 - 0.09	54.6	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	47.1	113.5	mg/kg	54SB47A DUP AVG (D)	11/11	0.11 - 0.14	113.5	2,346	N	30,660	N	IND	N	BSL
		TCL Pesticides/PCBs														
	72-55-9	4,4'-DDE	ND	ND	mg/kg	NA	0/4	--	ND	1.9E+00	C	8.4E+00	C	IND	N	NA
	5103-71-9	alpha-Chlordane [4]	ND	ND	mg/kg	NA	0/4	--	ND	1.8E+00	C	8.2E+00	C	IND	N	NA
	319-86-8	delta-BHC [5]	ND	ND	mg/kg	NA	0/4	--	ND	1.0E-01	C	4.5E-01	C	IND	N	NA
	60-57-1	Dieldrin	ND	ND	mg/kg	NA	0/4	--	ND	4.0E-02	C	1.8E-01	C	IND	N	NA
	7421-93-4	Endrin aldehyde [6]	4.4E-03	4.4E-03	mg/kg	54SB73A	1/4	0.00243 - 0.00295	4.4E-03	2.3E+00	N	3.1E+01	N	IND	N	BSL
	53494-70-5	Endrin ketone [6]	ND	ND	mg/kg	NA	0/4	--	ND	2.3E+00	N	3.1E+01	N	IND	N	NA
	5103-74-2	gamma-Chlordane [4]	ND	ND	mg/kg	NA	0/4	--	ND	1.8E+00	C	8.2E+00	C	IND	N	NA
	76-44-8	Heptachlor	ND	ND	mg/kg	NA	0/4	--	ND	1.4E-01	C	6.4E-01	C	IND	N	NA
	1024-57-3	Heptachlor epoxide	ND	ND	mg/kg	NA	0/4	--	ND	7.0E-02	C	3.1E-01	C	IND	N	NA
	72-43-5	Methoxychlor	ND	ND	mg/kg	NA	0/4	--	ND	3.9E+01	N	5.1E+02	N	IND	N	NA
	11097-69-1	Aroclor 1254 [7]	1.5E-02	1.5E-02	mg/kg	54SB71A	1/4	0.00748 - 0.00952	1.5E-02	1.6E-01	C	1.4E+00	C	IND	N	BSL
	11096-82-5	Aroclor 1260	ND	ND	mg/kg	NA	0/4	--	ND	3.2E-01	C	1.4E+00	C	IND	N	NA
		TCL SVOCs														
	121-14-2	2,4-Dinitrotoluene	ND	ND	mg/kg	NA	0/11	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	606-20-2	2,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/11	--	ND	7.8E+00	N	1.0E+02	N	IND	N	NA
	117-81-7	Bis(2-ethylhexyl)phthalate	5.0E-02	3.2E-01	mg/kg	54SB53A (D)	5/11	0.032 - 0.032	3.2E-01	4.6E+01	C	2.0E+02	C	IND	N	BSL
	84-74-2	Di-n-butylphthalate	6.0E-02	6.0E-02	mg/kg	54SB53A (D)	1/11	0.38 - 0.43	6.0E-02	7.8E+02	N	1.0E+04	N	IND	N	BSL
	84-66-2	Diethylphthalate	3.6E-02	1.5E+00	mg/kg	54SB53A (D)	4/11	0.38 - 0.43	1.5E+00	6.3E+03	N	8.2E+04	N	IND	N	BSL
	131-11-3	Dimethylphthalate	ND	ND	mg/kg	NA	0/11	--	ND	--	--	--	--	--	N	NA
	86-30-6	N-Nitrosodiphenylamine	ND	ND	mg/kg	NA	0/11	--	ND	1.3E+02	C	5.8E+02	C	IND	N	NA
		Dioxin/Furans														
	--	Total 2,3,7,8-TCDD Equivalents	6.4E-08	5.3E-06	mg/kg	54SB53A (D)	12/12	--	5.3E-06	4.3E-06	--	1.9E-05	--	IND	Y	**ARES**
		PAHs														
	83-32-9	Acenaphthene	3.4E-02	3.0E+00	mg/kg	54SB53A (D)	3/11	0.0058 - 0.0059	3.0E+00	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene [8]	ND	ND	mg/kg	NA	0/11	--	ND	2.3E+02	N	3.1E+03	N	IND	N	NA
	56-55-3	Benzo(a)anthracene	1.3E-02	1.3E-02	mg/kg	54SB50A (D)	1/11	0.0022 - 0.0022	1.3E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	50-32-8	Benzo(a)pyrene	6.9E-03	6.9E-03	mg/kg	54SB41A (D)	1/11	0.0016 - 0.0016	6.9E-03	2.2E-02	C	3.9E-01	C	IND	N	BSL
	205-99-2	Benzo(b)fluoranthene	3.2E-02	7.2E-02	mg/kg	54SB53A (D)	2/11	0.0017 - 0.0017	7.2E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	191-24-2	Benzo(g,h,i)perylene [8]	8.4E-02	8.4E-02	mg/kg	54SB50A (D)	1/11	0.0036 - 0.0036	8.4E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	6.7E-03	6.7E-03	mg/kg	54SB53A (D)	1/11	0.0014 - 0.0014	6.7E-03	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	1.3E-02	1.3E-02	mg/kg	54SB50A (D)	1/11	0.0024 - 0.0024	1.3E-02	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	ND	ND	mg/kg	NA	0/11	--	ND	2.2E-02	C	3.9E-01	C	IND	N	NA
	206-44-0	Fluoranthene	7.2E-03	2.8E-02	mg/kg	54SB53A (D)	5/11	0.0021 - 0.0021	2.8E-02	3.1E+02	N	4.1E+03	N	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	ND	ND	mg/kg	NA	0/11	--	ND	2.2E-01	C	3.9E+00	C	IND	N	NA
	91-20-3	Naphthalene	8.9E-02	8.9E-02	mg/kg	54SB41A (D)	1/11	0.014 - 0.014	8.9E-02	1.6E+02	N	2.0E+03	N	IND	N	BSL
	85-01-8	Phenanthrene [8]	2.1E-02	2.1E-02	mg/kg	54SB53A (D)	1/11	0.0085 - 0.0085	2.1E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	129-00-0	Pyrene	1.1E-02	6.5E-02	mg/kg	54SB50A (D)	5/11	0.0043 - 0.0043	6.5E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL

Table G.2-3b
Area B COPC Determination - Surface Soil - Post Removal Action
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Surface Soil
Exposure Medium:	Surface Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
		Explosives														
	99-35-4	1,3,5-Trinitrobenzene	ND	ND	mg/kg	NA	0/0	--	ND	2.3E+02	N	3.1E+03	N	IND	N	NA
	118-96-7	2,4,6-Trinitrotoluene[9]	ND	ND	mg/kg	NA	0/11	--	ND	3.9E+00	N	5.1E+01	N	IND	N	NA
	121-14-2	2,4-Dinitrotoluene	ND	ND	mg/kg	NA	0/11	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	--	Dinitrotoluene Mix	ND	ND	mg/kg	NA	0/11	--	ND	9.4E-01	N	4.2E+00	N	IND	N	NA
	35572-78-2	2-Amino-4,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/11	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	1946-51-0	4-Amino-2,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/11	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	--	Aminodinitrotoluenes	ND	ND	mg/kg	NA	0/11	--	ND	1.6E+01	N	2.0E+02	N	IND	N	NA
	121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	ND	ND	mg/kg	NA	0/11	--	ND	5.8E+00	C	2.6E+01	C	IND	N	NA
		Nitroglycerin														
	55-63-0	Nitroglycerin	ND	ND	mg/kg	NA	0/11	--	ND	7.8E-01	N	1.0E+01	N	IND	N	NA

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RBC = USEPA Region III Risk-Based Concentration
(RBC) values from the October 11, 2007,
RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
N/C = Noncarcinogenic/Carcinogenic per EPA RBC Table (October 2007)
[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Chlordane RBC value was used
[5] = Alpha-BHC RBC value was used
[6] = Endrin RBC value was used
[7] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[8] = Pyrene RBC value was used
[9] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

[D] = Re-sampled; Dioxin/Furans analyzed January 2007.

ARAR = Applicable, Relevant, and Appropriate Requirement
USEPA = U.S. Environmental Protection Agency
TBC = To-Be-Considered
RDA = Recommended Daily Allowance
IND = Adjusted Industrial RBC
AL = USEPA Action Level

ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

ND = Not Detected
NA = Not Applicable

Table G.2-3c
Area B COPC Determination - Total Soil - Post Removal Action
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Medium:	Total Soil
Exposure Medium:	Total Soil

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)		Potential ARAR/TBC Value		Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Total Soil		**TAL Metals**														
	7429-90-5	Aluminum	6,910	19,000	mg/kg	54SB44B	27/27	2.2 - 7.1	19,000	7,821	N	102,200	N	IND	Y	**ARES**
	7440-36-0	Antimony	0.33	0.57	mg/kg	54SB52A	8/22	0.12 - 0.49	0.57	3.13	N	40.88	N	IND	N	BSL
	7440-38-2	Arsenic	0.35	2.1	mg/kg	54SB44B	26/27	0.25 - 0.38	2.1	0.426	C	1.91	C	IND	Y	***ARES/IND***
	7440-39-3	Barium	50.4	241	mg/kg	54SB51A	27/27	0.02 - 0.04	241	1,564	N	20,440	N	IND	N	BSL
	7440-41-7	Beryllium	0.42	1.1	mg/kg	54SB51A	27/27	0.01 - 0.03	1.1	15.6	N	204.4	N	IND	N	BSL
	7440-43-9	Cadmium	ND	ND	mg/kg	NA	0/27	--	ND	7.82	N	102.2	N	IND	N	NA
	7440-70-2	Calcium	313	1,680	mg/kg	54SB47A DUP AVG (D)	27/27	0.97 - 1.9	1,680	--	--	1,095,000	--	RDA	N	BSL
	7440-47-3	Chromium [1]	10.9	24.1	mg/kg	54SB39A (D)	27/27	0.06 - 0.1	24.1	23.46	N	306.6	N	IND	Y	**ARES**
	7440-48-4	Cobalt	4.5	12	mg/kg	54SB39A (D)	27/27	0.06 - 0.09	12	--	--	--	--	--	Y	NSV
	7440-50-8	Copper	0.39	21	mg/kg	54SB51B	25/25	0.14 - 0.19	21	312.9	N	4,088	N	IND	N	BSL
	7439-89-6	Iron	11,600	28,400	mg/kg	54SB44B	27/27	1.2 - 1.8	28,400	5,475	N	71,540	N	IND	Y	**ARES**
	7439-92-1	Lead [2]	4	76	mg/kg	54SB53A (D)	27/27	0.12 - 0.3	76	400	--	750	--	USEPA	N	BSL
	7439-95-4	Magnesium	1,120	4,860	mg/kg	54SB44B	27/27	0.61 - 1.5	4,860	--	--	156,400	--	RDA	N	BSL
	7439-96-5	Manganese	159	767	mg/kg	54SB41A (D)	27/27	0.02 - 0.03	767	156.4	N	2,044	N	IND	Y	**ARES**
	7439-97-6	Mercury [3]	0.018	0.12	mg/kg	54SB53A (D)	23/27	0.016 - 0.022	0.12	2.3	--	31	--	IND	N	BSL
	7440-02-0	Nickel	7	15.60	mg/kg	54SB44B	27/27	0.1 - 0.13	15.6	156.4	N	2,044	N	IND	N	BSL
	7440-09-7	Potassium	627	2,720	mg/kg	54SB44B	27/27	3.9 - 15.7	2,720	--	--	2,607,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.52	1.8	mg/kg	54SB51A	27/27	0.3 - 0.44	1.8	39.11	N	511	N	IND	N	BSL
	7440-22-4	Silver	ND	ND	mg/kg	NA	0/27	--	ND	39.11	N	511	N	IND	N	NA
	7440-23-5	Sodium	67.6	244	mg/kg	54SB52A	27/27	25.1 - 38.3	244	--	--	625,700	--	RDA	N	BSL
	7440-62-2	Vanadium	18.8	54.6	mg/kg	54SB52A	27/27	0.07 - 0.09	54.6	7.82	N	102.2	N	IND	Y	**ARES**
	7440-66-6	Zinc	26.5	113.5	mg/kg	54SB47A DUP AVG (D)	27/27	0.1 - 0.14	113.5	2,346	N	30,660	N	IND	N	BSL
		TCL Pesticides/PCBs														
	72-55-9	4,4'-DDE	ND	ND	mg/kg	NA	0/17	--	ND	1.9E+00	C	8.4E+00	C	IND	N	NA
	309-00-2	Aldrin	ND	ND	mg/kg	NA	0/17	--	ND	3.8E-02	C	1.7E-01	C	IND	N	NA
	319-84-6	alpha-BHC	8.3E-04	8.3E-04	mg/kg	54SB48B	1/17	0.00026 - 0.00359	8.3E-04	1.0E-01	C	4.5E-01	C	IND	N	BSL
	5103-71-9	alpha-Chlordane [4]	ND	ND	mg/kg	NA	0/17	--	ND	1.8E+00	C	8.2E+00	C	IND	N	NA
	319-85-7	beta-BHC	3.5E-03	3.5E-03	mg/kg	54SB48B	1/17	0.00028 - 0.00445	3.5E-03	3.5E-01	C	1.6E+00	C	IND	N	BSL
	319-86-8	delta-BHC [5]	1.2E-03	1.2E-03	mg/kg	54SB48B	1/17	0.00015 - 0.00276	1.2E-03	1.0E-01	C	4.5E-01	C	IND	N	BSL
	60-57-1	Dieldrin	ND	ND	mg/kg	NA	0/17	--	ND	4.0E-02	C	1.8E-01	C	IND	N	NA
	7421-93-4	Endrin aldehyde [6]	4.4E-03	5.6E-03	mg/kg	54SB73B	2/17	0.00035 - 0.00308	5.6E-03	2.3E+00	N	3.1E+01	N	IND	N	BSL
	53494-70-5	Endrin ketone [6]	ND	ND	mg/kg	NA	0/17	--	ND	2.3E+00	N	3.1E+01	N	IND	N	NA
	58-89-9	gamma-BHC (Lindane)	1.1E-03	1.1E-03	mg/kg	54SB48B	1/17	0.00022 - 0.00372	1.1E-03	4.9E-01	C	2.2E+00	C	IND	N	BSL
	5103-74-2	gamma-Chlordane [4]	ND	ND	mg/kg	NA	0/17	--	ND	1.8E+00	C	8.2E+00	C	IND	N	NA
	76-44-8	Heptachlor	ND	ND	mg/kg	NA	0/17	--	ND	1.4E-01	C	6.4E-01	C	IND	N	NA
	1024-57-3	Heptachlor epoxide	2.6E-03	2.6E-03	mg/kg	54SB49B	1/17	0.00026 - 0.00491	2.6E-03	7.0E-02	C	3.1E-01	C	IND	N	BSL
	72-43-5	Methoxychlor	ND	ND	mg/kg	NA	0/17	--	ND	3.9E+01	N	5.1E+02	N	IND	N	NA
	11097-69-1	Aroclor 1254 [7]	1.5E-02	1.5E-02	mg/kg	54SB71A	1/17	0.0068 - 0.00952	1.5E-02	1.6E-01	C	1.4E+00	C	IND	N	BSL
	11096-82-5	Aroclor 1260	ND	ND	mg/kg	NA	0/17	--	ND	3.2E-01	C	1.4E+00	C	IND	N	NA
		TCL SVOCs														
	117-81-7	Bis(2-ethylhexyl)phthalate	4.0E-02	3.2E-01	mg/kg	54SB53A (D)	8/27	0.032 - 0.032	3.2E-01	4.6E+01	C	2.0E+02	C	IND	N	BSL
	86-74-8	Carbazole	ND	ND	mg/kg	NA	0/27	--	ND	3.2E+01	C	1.4E+02	C	IND	N	NA
	84-74-2	Di-n-butylphthalate	6.0E-02	6.0E-02	mg/kg	54SB53A (D)	1/27	0.35 - 0.43	6.0E-02	7.8E+02	N	1.0E+04	N	IND	N	BSL
	117-84-0	Di-n-octylphthalate	ND	ND	mg/kg	NA	0/27	--	ND	--	--	--	--	--	N	NA
	84-66-2	Diethylphthalate	3.6E-02	1.5E+00	mg/kg	54SB53A (D)	5/27	0.35 - 0.43	1.5E+00	6.3E+03	N	8.2E+04	N	IND	N	BSL
	131-11-3	Dimethylphthalate	ND	ND	mg/kg	NA	0/27	--	ND	--	--	--	--	--	N	NA
	86-30-6	N-Nitrosodiphenylamine	ND	ND	mg/kg	NA	0/27	--	ND	1.3E+02	C	5.8E+02	C	IND	N	NA
		Dioxin/Furans														
	--	Total 2,3,7,8-TCDD Equivalents	7.0E-09	5.3E-06	mg/kg	54SB53A (D)	41/41	--	5.3E-06	4.3E-06	--	1.9E-05	--	IND	Y	**ARES**
		PAHs														
	83-32-9	Acenaphthene	2.6E-02	2.0E+01	mg/kg	54SB44B	6/27	0.0058 - 0.0059	2.0E+01	4.7E+02	N	6.1E+03	N	IND	N	BSL
	208-96-8	Acenaphthylene [6]	3.4E-01	3.4E-01	mg/kg	54SB44B	1/27	0.0059 - 0.0059	3.4E-01	2.3E+02	N	3.1E+03	N	IND	N	BSL
	120-12-7	Anthracene	7.2E-03	1.3E-02	mg/kg	54SB54B DUP AVG(D)	2/27	0.0054 - 0.0054	1.3E-02	2.3E+03	N	3.1E+04	N	IND	N	BSL
	56-55-3	Benzo(a)anthracene	6.6E-03	2.5E-02	mg/kg	54SB44B	4/27	0.0022 - 0.0022	2.5E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	50-32-8	Benzo(a)pyrene	5.8E-03	7.4E-02	mg/kg	54SB52B	5/27	0.0016 - 0.0016	7.4E-02	2.2E-02	C	3.9E-01	C	IND	Y	**ARES**
	205-99-2	Benzo(b)fluoranthene	6.7E-03	8.7E-02	mg/kg	54SB44B	6/27	0.0017 - 0.0017	8.7E-02	2.2E-01	C	3.9E+00	C	IND	N	BSL
	191-24-2	Benzo(g,h,i)perylene [6]	1.2E-02	8.4E-02	mg/kg	54SB50A (D)	3/27	0.0036 - 0.0036	8.4E-02	2.3E+02	N	3.1E+03	N	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	6.7E-03	4.4E-02	mg/kg	54SB44B	4/27	0.0014 - 0.0014	4.4E-02	2.2E+00	C	3.9E+01	C	IND	N	BSL
	218-01-9	Chrysene	9.0E-03	4.9E-02	mg/kg	54SB44B	4/27	0.0024 - 0.0024	4.9E-02	2.2E+01	C	3.9E+02	C	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	1.1E-02	1.1E-02	mg/kg	54SB54B DUP AVG(D)	1/27	0.0042 - 0.0042	1.1E-02	2.2E-02	C	3.9E-01	C	IND	N	BSL

Table G.2-3c
Area B COPC Determination - Total Soil - Post Removal Action
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value (N/C)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
	206-44-0	Fluoranthene	7.2E-03	6.4E-02	mg/kg	54SB44B	8/27	0.0021 - 0.0021	6.4E-02	3.1E+02 N	4.1E+03 N	IND	N	BSL
	86-73-7	Fluorene	2.1E-02	7.3E-02	mg/kg	54SB44B	2/27	0.014 - 0.014	7.3E-02	3.1E+02 N	4.1E+03 N	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	5.1E-03	3.5E-02	mg/kg	54SB44B	4/27	0.0025 - 0.0025	3.5E-02	2.2E-01 C	3.9E+00 C	IND	N	BSL
	91-20-3	Naphthalene	8.9E-02	8.3E-01	mg/kg	54SB44B	3/27	0.014 - 0.014	8.3E-01	1.6E+02 N	2.0E+03 N	IND	N	BSL
	85-01-8	Phenanthrene [6]	1.2E-02	4.8E-02	mg/kg	54SB44B	3/27	0.0085 - 0.0085	4.8E-02	2.3E+02 N	3.1E+03 N	IND	N	BSL
	129-00-0	Pyrene	7.6E-03	6.5E-02	mg/kg	54SB50A (D)	14/27	0.0043 - 0.0043	6.5E-02	2.3E+02 N	3.1E+03 N	IND	N	BSL
		Explosives												
	99-35-4	1,3,5-Trinitrobenzene	ND	ND	mg/kg	NA	0/0	--	ND	2.3E+02 N	3.1E+03 N	IND	N	NA
	118-96-7	2,4,6-Trinitrotoluene [9]	ND	ND	mg/kg	NA	0/27	--	ND	3.9E+00 N	5.1E+01 N	IND	N	NA
	121-14-2	2,4-Dinitrotoluene	ND	ND	mg/kg	NA	0/27	--	ND	1.6E+01 N	2.0E+02 N	IND	N	NA
	--	Dinitrotoluene Mix	ND	ND	mg/kg	NA	0/27	--	ND	9.4E-01 N	4.2E+00 N	IND	N	NA
	35572-78-2	2-Amino-4,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/27	--	ND	1.6E+01 N	2.0E+02 N	IND	N	NA
	1946-51-0	4-Amino-2,6-Dinitrotoluene	ND	ND	mg/kg	NA	0/27	--	ND	1.6E+01 N	2.0E+02 N	IND	N	NA
	--	Aminodinitrotoluenes	ND	ND	mg/kg	NA	0/27	--	ND	1.6E+01 N	2.0E+02 N	IND	N	NA
	2691-41-0	HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,	ND	ND	mg/kg	NA	0/27	--	ND	3.9E+02 N	5.1E+03 N	IND	N	NA
	121-82-4	RDX (Hexahydro-1,3,5-trinitro-1,3,5-tria	ND	ND	mg/kg	NA	0/27	--	ND	5.8E+00 C	2.6E+01 C	IND	N	NA
		Nitroglycerin												
	55-63-0	Nitroglycerin	ND	ND	mg/kg	NA	0/27	--	ND	7.8E-01 N	1.0E+01 N	IND	N	NA

Notes:

COPC = Chemical of Potential Concern
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semivolatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TIC = Tentatively Identified Compound
mg/kg = Milligram Per Kilogram
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and October 11, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
N/C = Noncarcinogenic/Carcinogenic per EPA RBC Table (October 2007)
[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Mercuric chloride soil RBC value used
[4] = Chlordane RBC value was used
[5] = Alpha-BHC RBC value was used
[6] = Endrin RBC value was used
[7] = Noncarcinogenic Residential RBC value for Aroclor 1254 was used for screening
[8] = Pyrene RBC value was used
[9] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening

[D] = Re-sampled; Dioxin/Furans analyzed January 2007.

USEPA = U.S. Environmental Protection Agency
ARAR = Applicable, Relevant, and Appropriate Requirement
TBC = To-Be-Considered
RDA = Recommended Daily Allowance
IND = Adjusted Industrial RBC
AL = USEPA Action Level

ARES = Above Residential RBC
ARES/IND = Above Residential RBC/Industrial RBC
BSL = Below Residential/Industrial RBC Screening Levels
NSV = No Screening Value Available

ND = Not Detected
NA = Not Applicable

Table G.2-3d
Area B Post-Removal Action EPCs - Total Soil
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

BENZO(A)PYRENE (ug/kg)

General Statistics

Number of Valid Data	27	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	22
		Percent Non-Detects	81.48%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	5.8	Minimum Detected	1.758
Maximum Detected	74	Maximum Detected	4.304
Mean of Detected	26.34	Mean of Detected	2.784
SD of Detected	29.01	SD of Detected	1.094
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	1.6	Maximum Non-Detect	0.47

Warning: There are only 5 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.799	Shapiro Wilk Test Statistic	0.901
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.53	Mean	0.334
SD	15.22	SD	1.265
95% DL/2 (t) UCL	10.53	95% H-Stat (DL/2) UCL	4.66

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-1.65
		SD in Log Scale	3.011
		Mean in Original Scale	5.173
		SD in Original Scale	15.34
		95% Percentile Bootstrap UCL	10.34
		95% BCA Bootstrap UCL	13.67

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.599	**Data appear Normal at 5% Significance Level**	
Theta Star	43.98		
nu star	5.989		
A-D Test Statistic	0.42	**Nonparametric Statistics**	
5% A-D Critical Value	0.69	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.69	Mean	9.604
5% K-S Critical Value	0.364	SD	13.72
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	2.953
		95% KM (t) UCL	14.64
Assuming Gamma Distribution		95% KM (z) UCL	14.46
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	13.62
Minimum	1E-09	95% KM (bootstrap t) UCL	40.91
Maximum	862.9	95% KM (BCA) UCL	36.96
Mean	280.1	95% KM (Percentile Bootstrap) UCL	18
Median	186.9	95% KM (Chebyshev) UCL	22.47
SD	277	97.5% KM (Chebyshev) UCL	28.04
k star	0.368	99% KM (Chebyshev) UCL	38.98
Theta star	760.7		
Nu star	19.88	**Potential UCLs to Use**	
AppChi2	10.76	95% KM (t) UCL	14.64
95% Gamma Approximate UCL	517.3	95% KM (Percentile Bootstrap) UCL	18
95% Adjusted Gamma UCL	538.8		

Note: DL/2 is not a recommended method.

Table G.2-3e
EPCs including Soil-to-Groundwater Remedial Goals, Residual Soil EPCs, and Groundwater Beneficial Reuse Remedial Goals
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Soil Analyte Surface Soil	CAS	EPC (mg/kg)	Soil Analyte Total Soil	CAS	EPC (mg/kg)	Groundwater Analyte	CAS	EPC (ug/L)
Aroclor 1254	11097-69-1	0.25	Aroclor 1254	11097-69-1	0.25	Manganese	7439-96-5	72.1
Heptachlor Epoxide	1024-57-3	0.0039	Heptachlor Epoxide	1024-57-3	0.0039			
Dieldrin	60-57-1	0.00446	Dieldrin	60-57-1	0.00446			
2,4,6-Trinitrotoluene	118-96-7	1.45	Benzo(a)pyrene	50-32-8	0.0146			
2,4-Dinitrotoluene	121-14-2	0.037	2,4,6-Trinitrotoluene	118-96-7	1.45			
Dinitrotoluene Mix	--	0.037	2,4-Dinitrotoluene	121-14-2	0.037			
RDX	121-82-4	0.134	Dinitrotoluene Mix	--	0.037			
Nitroglycerin	55-63-0	0.057	RDX	121-82-4	0.134			
2,3,7,8-TCDD TEQ	1746-01-6	6.57E-06	Nitroglycerin	55-63-0	0.057			
			2,3,7,8-TCDD TEQ	1746-01-6	6.57E-06			

Notes:
CAS = Chemical Abstract System
EPC = Exposure Point Concentration
= Remedial Goal
= Residual Soil EPC
= Groundwater MDC
mg/kg = milligam per kilogram
ug/L = microgram per liter

Table G.2-3f
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Maintenance Worker
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Aroclor 1254	3.E-08	--	2.E-08	5.E-08	Aroclor 1254	eyes	2.E-03	--	1.E-03	4.E-03
			Heptachlor Epoxide	2.E-09	--	8.E-10	3.E-09	Heptachlor Epoxide	liver	6.E-05	--	2.E-05	8.E-05
			Dieldrin	5.E-09	--	2.E-09	7.E-09	Dieldrin	liver	2.E-05	--	6.E-06	2.E-05
			2,4,6-Trinitrotoluene	3.E-09	--	3.E-10	3.E-09	2,4,6-Trinitrotoluene	liver	6.E-04	--	6.E-05	6.E-04
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	4.E-06	--	1.E-06	5.E-06
			Dinitrotoluene Mix	2.E-09	--	6.E-10	2.E-09	Dinitrotoluene Mix	NA	--	--	--	--
			RDX	1.E-09	--	1.E-11	1.E-09	RDX	prostate	9.E-06	--	4.E-07	9.E-06
			Nitroglycerin	7.E-11	--	2.E-12	7.E-11	Nitroglycerin	vascular	1.E-04	--	4.E-06	1.E-04
			2,3,7,8-TCDD TEQ	7.E-08	--	7.E-09	8.E-08	2,3,7,8-TCDD TEQ	--	--	--	--	--
			Total	1.2.E-07	--	3.E-08	1.E-07	Total		3.E-03	--	1.E-03	5.E-03
	Air	Air (Fugitive Dust)	Aroclor 1254	--	3.E-12	--	3.E-12	Aroclor 1254	NA	--	--	--	--
			Heptachlor Epoxide	--	2.E-13	--	2.E-13	Heptachlor Epoxide	NA	--	--	--	--
			Dieldrin	--	5.E-13	--	5.E-13	Dieldrin	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	6.E-12	--	6.E-12	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	1.E-11	--	1.E-11	Total		--	--	--	--
							Total Risk Across Soil	1.E-07				Total Hazard Index Across Soil	5.E-03

Total Risk Across All Media and All Exposure Routes	1.E-07
Total Hazard Index Across All Media and All Exposure Routes	5.E-03

Total blood HI across all media =	5.E-06
Total CNS HI across all media =	5.E-06
Total liver HI across all media =	7.E-04
Total vascular HI across all media =	1.E-04
Total eyes HI across all media =	4.E-03
Total prostate HI across all media =	9.E-06

Table G.2-3g
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Commercial Worker
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aroclor 1254	9.E-08	--	8.E-08	2.E-07	Aroclor 1254	eyes	6.E-03	--	6.E-03	1.E-02
			Heptachlor epoxide	6.E-09	--	4.E-09	1.E-08	Heptachlor epoxide	liver	1.E-04	--	1.E-04	2.E-04
			Dieldrin	1.E-08	--	8.E-09	2.E-08	Dieldrin	liver	4.E-05	--	3.E-05	7.E-05
			Benzo(a)pyrene	2.E-08	--	2.E-08	3.E-08	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	5.E-09	--	9.E-10	6.E-09	2,4,6-Trinitrotoluene	liver	9.E-04	--	2.E-04	1.E-03
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	4.E-06	--	2.E-06	6.E-06
			Dinitrotoluene Mix	2.E-09	--	1.E-09	3.E-09	Dinitrotoluene Mix	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	2.E-05	--	9.E-07	2.E-05
			RDX	8.E-10	--	2.E-11	8.E-10	RDX	prostate	7.E-06	--	6.E-07	7.E-06
			2,3,7,8-TCDD TEQ	2.E-07	--	3.E-08	2.E-07	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	3.E-07	--	1.E-07	4.E-07	Total		7.E-03	--	6.E-03	1.E-02
	Air	Air (Fugitive Dust)	Aroclor 1254	--	2.E-11	--	2.E-11	Aroclor 1254	NA	--	--	--	--
			Heptachlor epoxide	--	1.E-12	--	1.E-12	Heptachlor epoxide	NA	--	--	--	--
			Dieldrin	--	3.E-12	--	3.E-12	Dieldrin	NA	--	--	--	--
			Benzo(a)pyrene	--	2.E-12	--	2.E-12	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			Aminodinitrotoluenes	--	--	--	--	Aminodinitrotoluenes	NA	--	--	--	--
			RDX	--	--	--	--	RDX	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	4.E-11	--	4.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	7.E-11	--	7.E-11	Total		--	--	--	--
Groundwater	Groundwater	Groundwater	Manganese	--	--	--	--	Manganese	CNS	4.E-02	--	7.E-04	4.E-02
			Total	--	--	--	--	Total		4.E-02	--	7.E-04	4.E-02

Total Risk Across Soil	4.E-07	Total Hazard Index Across Soil	1.E-02
Total Risk Across Groundwater	--	Total Hazard Index Across Groundwater	4.E-02
Total Risk Across All Media and All Exposure Routes	4.E-07	Total Hazard Index Across All Media and All Exposure Routes	5.E-02

Total blood HI across all media =	6.E-06
Total CNS HI across all media =	4.E-02
Total liver HI across all media =	1.E-03
Total vascular HI across all media =	3.E-04
Total eyes HI across all media =	1.E-02
Total prostate HI across all media =	7.E-06

Table G.2-3h
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Construction Worker
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aroclor 1254	2.E-08	--	9.7.E-09	3.E-08	Aroclor 1254	eyes	2.E-02	--	7.E-03	2.E-02
			Heptachlor epoxide	2.E-09	--	4.9.E-10	2.E-09	Heptachlor epoxide	liver	1.E-03	--	3.E-04	1.E-03
			Dieldrin	3.E-09	--	1.E-09	4.E-09	Dieldrin	liver	3.E-04	--	9.E-05	4.E-04
			Benzo(a)pyrene	5.E-09	--	2.E-09	7.E-09	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	1.E-09	--	1.E-10	1.E-09	2,4,6-Trinitrotoluene	liver	6.E-03	--	5.E-04	6.E-03
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	2.E-05	--	7.E-06	3.E-05
			Dinitrotoluene Mix	5.E-10	--	1.E-10	6.E-10	Dinitrotoluene Mix	NA	--	--	--	--
			RDX	2.E-10	--	2.E-12	2.E-10	RDX	prostate	4.E-05	--	2.E-06	4.E-05
			Nitroglycerin	4.E-11	--	1.E-12	5.E-11	Nitroglycerin	vascular	2.E-03	--	6.E-05	2.E-03
			2,3,7,8-TCDD TEQ	5.E-08	--	4.1.E-09	5.E-08	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	8.E-08	--	2.E-08	9.7.E-08	Total		2.5.E-02	--	8.E-03	3.3.E-02
	Air	Air (Fugitive Dust)	Aroclor 1254	--	1.E-09	--	1.E-09	Aroclor 1254	NA	--	--	--	--
			Heptachlor epoxide	--	8.E-11	--	8.E-11	Heptachlor epoxide	NA	--	--	--	--
			Dieldrin	--	2.E-10	--	2.E-10	Dieldrin	NA	--	--	--	--
			Benzo(a)pyrene	--	1.E-10	--	1.E-10	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			RDX	--	--	--	--	RDX	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	2.E-09	--	2.E-09	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	4.E-09	--	3.9.E-09	Total		--	--	--	--
Groundwater	Groundwater	Groundwater	Manganese	--	--	--	--	Manganese	CNS	4.E-04	--	6.E-03	6.E-03
				--	--	--	--			4.E-04	--	6.E-03	6.E-03

Total Risk Across Soil	1.E-07
Total Risk Across Groundwater	--
Total Risk Across All Media and All Exposure Routes	1.E-07

Total Hazard Index Across Soil	3.E-02
Total Hazard Index Across Groundwater	6.E-03
Total Hazard Index Across All Media and All Exposure Routes	4.E-02

Total blood HI across all media =	3.E-05
Total CNS HI across all media =	6.E-03
Total liver HI across all media =	8.E-03
Total vascular HI across all media =	2.E-03
Total eyes HI across all media =	2.E-02
Total prostate HI across all media =	4.E-05

Table G.2-3i
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Adult Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aroclor 1254	2.E-07	--	1.E-07	4.E-07	Aroclor 1254	eyes	2.E-02	--	1.E-02	3.E-02
			Heptachlor epoxide	2.E-08	--	7.E-09	2.E-08	Heptachlor epoxide	liver	4.E-04	--	2.E-04	6.E-04
			Dieldrin	3.E-08	--	1.E-08	5.E-08	Dieldrin	liver	1.E-04	--	5.E-05	2.E-04
			Benzo(a)pyrene*	9.E-08	--	5.E-08	1.E-07	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	1.E-08	--	2.E-09	1.E-08	2,4,6-Trinitrotoluene	liver	2.E-03	--	3.E-04	3.E-03
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	1.E-05	--	4.E-06	1.E-05
			Dinitrotoluene Mix	5.E-09	--	2.E-09	7.E-09	Dinitrotoluene Mix	NA	--	--	--	--
			RDX	2.E-09	--	3.E-11	2.E-09	RDX	prostate	2.E-05	--	1.E-06	2.E-05
			Nitroglycerin	5.E-10	--	2.E-11	5.E-10	Nitroglycerin	vascular	8.E-04	--	3.E-05	8.E-04
			2,3,7,8-TCDD TEQ	5.E-07	--	5.E-08	5.E-07	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	9.E-07	--	3.E-07	1.E-06	Total		2.E-02	--	1.E-02	3.E-02
	Air	Air (Fugitive Dust)	Aroclor 1254	--	4.E-12	--	4.E-12	Aroclor 1254	NA	--	--	--	--
			Heptachlor epoxide	--	3.E-13	--	3.E-13	Heptachlor epoxide	NA	--	--	--	--
			Dieldrin	--	6.E-13	--	6.E-13	Dieldrin	NA	--	--	--	--
			Benzo(a)pyrene*	--	7.E-13	--	7.E-13	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			RDX	--	--	--	--	RDX	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	9.E-12	--	9.E-12	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	1.E-11	--	1.E-11	Total		--	--	--	--
Groundwater	Groundwater	Groundwater	Manganese	--	--	--	--	Manganese	CNS	1.E-01	--	1.E-02	1.E-01
			Total	--	--	--	--	Total		1.E-01	--	1.E-02	1.E-01
							Total Risk Across Soil	1.E-06					Total Hazard Index Across Soil	3.E-02
							Total Risk Across Groundwater	--					Total Hazard Index Across Groundwater	1.E-01
							Total Risk Across All Media and All Exposure Routes	1.E-06					Total Hazard Index Across All Media and All Exposure Routes	1.E-01

Total blood HI across all media =	1.E-05
Total CNS HI across all media =	1.E-01
Total liver HI across all media =	3.E-03
Total vascular HI across all media =	8.E-04
Total eyes HI across all media =	3.E-02
Total prostate HI across all media =	2.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated accordance with USEPA Region III ADAF Guidance (11/08/2006).

Table G.2-3j
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Child Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aroclor 1254	5.E-07	--	2.E-07	8.E-07	Aroclor 1254	eyes	2.E-01	--	6.E-02	2.E-01
			Heptachlor epoxide	4.E-08	--	1.E-08	5.E-08	Heptachlor epoxide	liver	4.E-03	--	1.E-03	5.E-03
			Dieldrin	8.E-08	--	2.E-08	1.E-07	Dieldrin	liver	1.E-03	--	3.E-04	1.E-03
			Benzo(a)pyrene*	6.E-07	--	2.E-07	8.E-07	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	3.E-08	--	2.E-09	3.E-08	2,4,6-Trinitrotoluene	liver	2.E-02	--	2.E-03	2.E-02
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	CNS/ blood/ liver	1.E-04	--	3.E-05	1.E-04
			Dinitrotoluene Mix	1.E-08	--	3.E-09	1.E-08	Dinitrotoluene Mix	NA	--	--	--	--
			RDX	5.E-09	--	6.E-11	5.E-09	RDX	prostate	2.E-04	--	7.E-06	2.E-04
			Nitroglycerin	1.E-09	--	3.E-11	1.E-09	Nitroglycerin	vascular	7.E-03	--	2.E-04	7.E-03
			2,3,7,8-TCDD TEQ	1.E-06	--	9.E-08	1.E-06	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	2.E-06	--	6.E-07	3.E-06	Total		2.E-01	--	7.E-02	2.6.E-01
	Air	Air (Fugitive Dust)	Aroclor 1254	--	1.E-11	--	1.E-11	Aroclor 1254	NA	--	--	--	--
			Heptachlor epoxide	--	9.E-13	--	9.E-13	Heptachlor epoxide	NA	--	--	--	--
			Dieldrin	--	2.E-12	--	2.E-12	Dieldrin	NA	--	--	--	--
			Benzo(a)pyrene*	--	6.E-12	--	6.E-12	Benzo(a)pyrene	NA	--	--	--	--
			2,4,6-Trinitrotoluene	--	--	--	--	2,4,6-Trinitrotoluene	NA	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--	2,4-Dinitrotoluene	NA	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--	Dinitrotoluene Mix	NA	--	--	--	--
			RDX	--	--	--	--	RDX	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			2,3,7,8-TCDD TEQ	--	2.E-11	--	2.E-11	2,3,7,8-TCDD TEQ	NA	--	--	--	--
			Total	--	4.E-11	--	4.E-11			--	--	--	--
Groundwater	Groundwater	Groundwater	Manganese	--	--	--	--	Manganese	CNS	2.3.E-01	--	4.E-02	3.E-01
				--	--	--	--			2.3.E-01	--	4.E-02	2.7.E-01

Total Risk Across Soil	3.E-06	Total Hazard Index Across Soil	3.E-01
Total Risk Across Groundwater	--	Total Hazard Index Across Groundwater	3.E-01
Total Risk Across All Media and All Exposure Routes	3.E-06	Total Hazard Index Across All Media and All Exposure Routes	5.E-01

Total blood HI across all media =	1.E-04
Total CNS HI across all media =	3.E-01
Total liver HI across all media =	3.E-02
Total vascular HI across all media =	7.E-03
Total eyes HI across all media =	2.E-01
Total prostate HI across all media =	2.E-04

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated accordance with USEPA Region III ADAF Guidance (11/08/2006).

Table G.2-3k
Summary of Cancer Risks and Non-Cancer Hazards for COPCs - Residual Risk - Lifetime Resident
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
		Soil	Aroclor 1254	8.E-07	--	3.E-07	1.E-06
			Heptachlor epoxide	6.E-08	--	2.E-08	7.E-08
			Dieldrin	1.E-07	--	4.E-08	1.E-07
			Benzo(a)pyrene*	7.E-07	--	3.E-07	1.E-06
			2,4,6-Trinitrotoluene	4.E-08	--	4.E-09	5.E-08
			2,4-Dinitrotoluene	--	--	--	--
			Dinitrotoluene Mix	2.E-08	--	5.E-09	2.E-08
			Aminodinitrotoluenes	--	--	--	--
			RDX	7.E-09	--	9.E-11	7.E-09
			Nitroglycerin	2.E-09	--	5.E-11	2.E-09
			2,3,7,8-TCDD TEQ	2.E-06	--	1.E-07	2.E-06
			Total	3.E-06	--	8.E-07	4.E-06
	Air	Air (Fugitive Dust)	Aroclor 1254	--	2.E-11	--	2.E-11
			Heptachlor epoxide	--	1.E-12	--	1.E-12
			Dieldrin	--	2.E-12	--	2.E-12
			Benzo(a)pyrene*	--	7.E-12	--	7.E-12
			2,4,6-Trinitrotoluene	--	--	--	--
			2,4-Dinitrotoluene	--	--	--	--
			Dinitrotoluene Mix	--	--	--	--
			RDX	--	--	--	--
			Nitroglycerin	--	--	--	--
			2,3,7,8-TCDD TEQ	--	3.E-11	--	3.E-11
			Total	--	6.E-11	--	6.E-11
Groundwater	Groundwater	Groundwater used as tapwater	Manganese	--	--	--	--
				--	--	--	--

Total Risk Across Soil	4.E-06
Total Risk Across Groundwater	--
Total Risk Across All Media and All Exposure Routes	4.E-06

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated accordance with USEPA Region III ADAF Guidance (11/08/2006).

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APPENDIX G.3

CORRECTIVE MEASURES ALTERNATIVE FOUR: INDUSTRIAL REMEDIAL GOAL EVALUATION

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Table G.3-1
Cost Estimate: Corrective Measures Alternative Four
Excavation of Soil to Industrial RGs, Offsite Disposal, and Long-Term Monitoring of Groundwater
RCRA Facility Investigation Report/CMS
Radford Army Ammunition Plant, Radford, Virginia

Capital Costs

Item	Units	Unit Cost ($)	Quantity	Total ($)
Task 1 Soil Removal Action				
Task 1.1 Pre-Characterization of Waste				
Driller Mobilization	EA	660	1	$660
Direct Push Rig with Crew	DAY	1,705	2	$3,410
Liners for Soil Sampling	EA	4	84	$370
Driller Per Diem	DAY	144	2	$288
Vehicle for Investigation and Sampling	DAY	58	3	$174
Vehicle Fuel for Investigation and Sampling	GAL	3.78	31	$117
Per Diem for Investigation and Sampling	DAY	152	3	$457
55 DOT Drum - Furnish and Fill and Move to Accumulation Area	EA	99	2	$198
Sample Cooler Shipping	EA	90	8	$741
Soil Sampling Equipment	EVENT	375	1	$375
IDM Waste Characterization - Soil (pH, Full TCLP, Explosives, and Paint Filter)	EA	1,503	23	$34,575
IDM Waste Characterization - Water (pH, Full TCLP, COD)	EA	1,141	3	$3,422
Non Hazardous IDM Transportation	EA	660	1	$660
Non Hazardous IDM Disposal	DRUM	78	2	$156
			Subtotal Task 1.1	$45,602
Task 1.2 Soil Excavation & Backfill				
Mobilization and Decontamination Station	LS	1	15,000	$15,000
Access Roads	SY	15	1,000	$15,000
Sediment & Erosion Control	LF	10	540	$5,322
Water Truck	MONTH	2.5	6,900	$17,250
Excavation	BCY	7	5,000	$35,000
Sheet Piling (Installed, Pulled & Decontaminated)	SF	9	4,968	$44,712
Backfill (Offsite Material, Place and Compacted)	LCY	11	6,250	$68,750
Vehicle for Remedial Action Oversight	MONTH	1,445	2.5	$3,613
Vehicle Fuel for Remedial Action Oversight	GAL	3.78	376	$1,421
Per Diem for Remedial Action Oversight (for onsite 3 personnel)	DAY	152	120	$18,260
Sample Cooler Shipping	EA	90	18	$1,589
Excavation Monitoring and Sampling Equipment	MONTH	1,371	2.5	$3,427
Confimatory Soil Sample Analysis - Area A (Expl, Lead, Dioxins, Perchlorate, Pest.)	EA	1,093	14	$15,308
Confimatory Soil Sample Analysis - Area B (Expl.,Lead, Dioxins, Perchlorate, Pest., PCBs)	EA	1,170	45	$52,668
Non-Hazardous Soil Disposal (T&D)	TON	86	4,943	$424,109
Hazardous Soil Treatment and Disposal (T&D)	TON	260	2,057	$533,997
			Subtotal Task 1.2	$1,255,426
Task 1.3 Site Restoration				
Hydroseeding	SF	0.21	17,499	$3,665
Erosion Control Matting	SY	1.86	2,275	$4,232
Vehicle for Site Restoration Oversight	WK	350	1	$350
Vehicle Fuel for Site Restoration Oversight	GAL	3.78	34	$128
Per Diem for Site Restoration Oversight	DAY	152	5	$761
Equipment and Supplies for Site Restoration Oversight	EVENT	174	1	$174
			Subtotal Task 1.3	$9,309
			Subtotal Task 1	$1,310,337
Task 2 Monitoring Well Installation for LTM				
Task 2.1 Additional Monitoring Wells (4)				
Driller Mobilization	EA	1,265	1	$1,265
Tractor w/Forks & Bucket to Move IDM Drums	WK	1,100	1	$1,100
6" Air Drilling: 4-40 ft monitoring wells	FT	20	160	$3,168
2" Monitoring Well Installation	FT	24	160	$3,872
6" Surface Casing	EA	165	4	$660
4' x 4' Concrete Pads	EA	330	4	$1,320
Bollards - Furnish and Install/Paint	EA	99	4	$396
Decontamination	HR	248	4	$990
Decontamination Equipment - Steam Cleaner and Water Tank	DAY	110	2	$220
Temporary Decontamination Structure	EA	660	1	$660
Initial Well Development: Air Lift with 1" Pipe	HR	303	4	$1,210
Driller Per Diem	DAY	144	2	$288
55 DOT Drum - Furnish and Fill and Move to Accumulation Area	EA	99	21	$2,079
Vehicle for Well Installation Oversight and Well Development	WK	350	1	$350
Vehicle Fuel for Well Installation Oversight and Well Development	GAL	3.78	62	$233
Per Diem for Well Installation Oversight and Well Development	DAY	152	6	$913
Equipment for Well Installation	DAY	232	2	$465
Final Well Development: Surge and Pump Equipment	EVENT	633	1	$633
IDM Waste Characterization - Cuttings (pH, Full TCLP, Explosives,Paint Filter, Explosives)	EA	1,503	1	$1,503
IDM Waste Characterization - Decon Water (pH, Full TCLP, COD)	EA	1,141	1	$1,141
Non-Hazardous IDM Transportation	EA	660	1	$660
Non-Hazardous IDM Disposal	DRUM	78	21	$1,640
			Subtotal Task 2.1	$24,766

Table G.3-1
Cost Estimate: Corrective Measures Alternative Four
Excavation of Soil to Industrial RGs, Offsite Disposal, and Long-Term Monitoring of Groundwater
RCRA Facility Investigation Report/CMS
Radford Army Ammunition Plant, Radford, Virginia

Capital Costs Cont.

Item	Units	Unit Cost ($)	Quantity	Total ($)
Task 2.2 Site Close-Out/Monitoring Well Abandonment				
Driller Mobilization	EA	550	1	$550
2" Well Abandonment: Pressure Grout in Place	FT	11	600	$6,600
Remove of Stickup Surface Completion	EA	303	15	$4,538
Decontamination	HR	248	4	$990
Decontamination Equipment - Steam Cleaner and Water Tank	DAY	110	4	$440
Driller Per Diem	DAY	144	4	$576
Containerization and Disposal of Solid Waste	EA	165	15	$2,475
Vehicle for Well Abandonment	DAY	58	4	$232
Vehicle Fuel for Well Abandonment	GAL	3.78	4	$15
Per Diem for Well Abandonment	DAY	152	4	$609
			Subtotal Task 2.2	$17,025
			Subtotal Task 2	$41,790

Item	Units	Unit Cost ($)	Quantity	Total ($)
Task 3 Implementation of Institutional Controls				
Land Use Control/Deed Restriction	EA	10,000	1	$10,000
			Subtotal Task 3	$10,000
			Subtotal Tasks 1, 2, and 3	$1,362,127
	Project Management (5%)			$68,106
	Planning Documents (4%)			$54,485
	Construction Oversight (5.5%)			$74,917
	Reporting (1%)			$13,621
	As Built Drawings (1%)			$13,621
	Permitting (1%)			$13,621
	Other Direct Costs (10% of Labor)			$23,837
			Total - Task 1, 2, and 3	$1,624,336
	Engineering Design (4.5%)			$61,296
	Contingency (20%)			$324,867
			Total Capital Costs	$2,010,499

Annual O&M Costs

Item	Units	Unit Cost ($)	Quantity	Total ($S)
Quarterly Groundwater/Annual Surface Water & Sediment Pore Water Sampling				
Groundwater Sampling - Field Labor	HR	66	360	$23,760
Surface Water/Sediment Pore Water Sampling - Labor	HR	66	20	$1,320
Groundwater Sampling Equipment and Supplies	EVENT	729	4	$2,917
Hach Test Kit for Fe and Mg in Groundwater	EVENT	27	4	$107
Surface Water/Sediment Pore Water Equipment	EVENT	279	1	$279
Per Diem	DAY	152	42	$6,391
Vehicle	DAY	58	21	$1,218
Vehicle Fuel	GAL	3.78	134	$506
Sample Cooler Shipping	EA	90	49	$4,398
Quarterly Groundwater Sample Analysis (Expl, Perchlorate, TOC, DIC, Nitrate, Sulfate)	EA	384	68	$26,105
Annual Groundwater Sample Analysis (PCB, Pesticides, Dioxins at upgradient/POC wells)	EA	897	8	$7,172
Surface Water/Pore Water Sample Analysis (Expl, Perchlorate)	EA	257	12	$3,089
			Subtotal	$77,262
Reporting				
Quarterly Operational and Monitoring Report	EA	7500	4	$30,000
5 Year Review and Report	EA	15000	0.2	$3,000
			Subtotal	$33,000
			Subtotal Annual O&M Cost	$110,262
	Project Management (10.5%)			$11,578
			Total Annual O&M Cost	$121,840
	Contingency (20%)			$24,368
			Total Annual O&M Cost	$146,208
			Estimated Total Cost with 30 Years of O&M	**$6,396,734**
			Present Value @ 4.9%	**$4,283,921**

APPENDIX G.4

EOS® BARRIER DESIGN WORKSHEET
FOR ENHANCED *IN SITU* BIOREMEDIATION OF GROUNDWATER

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EOS Remediation, Inc.

EOS® BARRIER DESIGN WORKSHEET

Version 2.1 Rev. Date: March 7, 2007
www.EOSRemediation.com

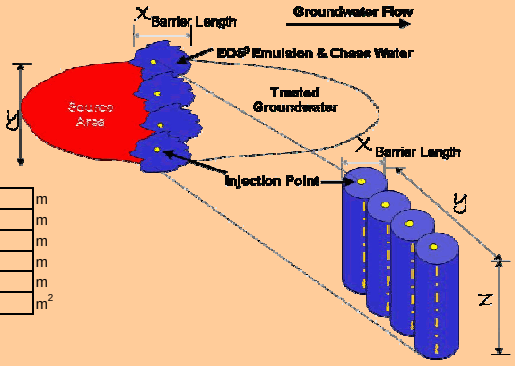
Help

Site Name:	RAAP
Location:	SWMU 54 AREA A
Project No.:	

Step 1: Select a Substrate from the EOS® Family of Bioremediation Products

Substrate Selected (pick from drop down list): EOS 450

For Product Literature Click Here



Step 2: EOS® Consumption During Contaminant Biodegradation / Biotransformation

Section A: Treatment Area Dimensions

Length of treatment area parallel to groundwater flow, " x"	40	ft	12.2	m
Width of treatment area perpendicular to groundwater flow, " y"	390	ft	118.9	m
Minimum depth to contamination	10	ft	3.0	m
Maximum depth of contamination	30	ft	9.1	m
Treatment thickness, "z"	20	ft	6.1	m
Treatment zone cross-sectional area, A = y * z	7,800	ft^2	724.6	m^2

Section B: Groundwater Flow Rate / Site Data

Soil Characteristics

Nominal Soil Type (pick from drop down list)	Sand			
Total Porosity (accept default or enter n)	0.38	(decimal)		
Effective Porosity (accept default or enter n_e)	0.33	(decimal)		
Soil bulk density; (1-n)*2.65 g/cc (accept calculated or enter dry bulk density)	1.64	g/cc	103	lbs / ft^3

Hydraulic Characteristics

Hydraulic Conductivity (accept default or enter K)	4.86	ft/day	1.7E-03	cm/sec
Hydraulic Gradient (accept default or enter i)	0.017	ft/ft		

Note: Since the hydraulic gradient ($i = dh/dx$) is negative, we ask you to enter $-i$ in the EOS® Design Tool so that you can enter a positive number for convenience.

Non-reactive Transport Velocity, $V_x = -(K \times i) / n_e$	0.25	ft/day	0.076	m/day
Groundwater flow rate through treatment zone, $Q = -KiA$	4820.38	gallons/day	18,248.40	L/day

Section C: Calculated Contact Length

Contact time (τ) between oil and contaminants (accept default or enter τ)	120	typical values 60 to 180 days, see comment
Calculated Contact Length (x) = $\tau * V_x$	30.0	ft

Treatment zone volume	312,000	ft^3	8,835	m^2
Treatment zone groundwater volume (volume * effective porosity)	770,141	gallons	2,915,503	L

Section D: Design Lifespan For One Application

	5	year(s)	typical values 5 to 10 years	
Estimated total groundwater volume treated over design life	9,567,337	gallons	36,218,824	L

Section E: Electron Acceptors

10

Inputs	Typical Value	GW Conc. (mg/L)	MW (g/mole)	e^- equiv./ mole	Stoichmetry *Contaminant/ H_2 (wt/wt H_2)*	Hydrogen Demand *(g H_2)*
Dissolved Oxygen (DO)	0 to 8	10	32.0	4	7.94	45632.90217
Nitrate Nitrogen (NO_3^- - N)	1 to 10	10	62.0	5	12.30	29437.15154
Sulfate (SO_4^{2-})	10 to 500	50	96.1	8	11.91	152012.7621
Tetrachloroethene (PCE), C_2Cl_4			165.8	8	20.57	
Trichloroethene (TCE), C_2HCl_3			131.4	6	21.73	
cis-1,2-dichloroethene (c-DCE), $C_2H_2Cl_2$			96.9	4	24.05	
Vinyl Chloride (VC), C_2H_3Cl			62.5	2	31.00	
Carbon tetrachloride, CCl_4			153.8	8	19.08	
Chloroform, $CHCl_3$			119.4	6	19.74	
sym-tetrachloroethane, $C_2H_2Cl_4$			167.8	8	20.82	
1,1,1-Trichloroethane (TCA), CH_3CCl_3			133.4	6	22.06	
1,1-Dichloroethane (DCA), CH_2CHCl_2			99.0	4	24.55	
Chloroethane, C_2H_5Cl			64.9	2	32.18	
Perchlorate, ClO_4^-		0.004	99.4	8	12.33	11.74866978
Hexavalent Chromium, Cr[VI]			52.0	3	17.20	
User added						
User added						
User added						

Section F: Additional Hydrogen Demand and Carbon Losses

Generation (Potential Amount Formed)	Typical Value	GW Conc. (mg/L)	MW (g/mole)	e^- equiv./ mole	Stoichmetry *Contaminant / H_2 (wt/wt H_2)*	Hydrogen Demand *(g H_2)*	DOC Released *(moles)*
Estimated Amount of $Fe2^+$ Formed	10 to 100	3	55.8	1	55.41	1961.050376	
Estimated Amount of Manganese (Mn^{2+}) Formed		3	54.9	2	27.25	3986.852752	

Estimated Amount of CH_4 Formed	5 to 20	10	16.0	8	1.99	182040.082	
Target Amount of DOC to Release	60 to 100	60	12.0				180928.27

Calculations assume:

1.) all reactions go to completion during passage through emulsified edible oil treated zone; and,

2.) perfect reaction stoichiometry.

EOS® Requirement Calculations Based on Hydrogen Demand and Carbon Losses

Stoichiometric Hydrogen Demand	914	pounds
DOC Released	13,727	pounds

EOS® Requirement Based on Hydrogen Demand and Carbon Loss

57 drums

Step 3: EOS® Requirement Based on Attachment by Aquifer Material

Soil Characteristics

Effective treatment thickness, "z_e" (typically less than 40%): 0.25

For Additional Information on Effective Thickness, Click Here

Weight of sediment to be treated: 8,000,393 lbs

Adsorptive Capacity of Soil (accept default or enter site specific value): 0.0013 lbs EOS® / lbs sediment

EOS® Attachment by Aquifer Material[1]

- Fine sand with some clay 0.001 to 0.002 lbs EOS® / lbs soil
- Sand with higher silt/clay content 0.002 to 0.004 lbs EOS® / lbs soil

[1]Default values provided based on laboratory studies completed by NCSU

For Additional Data, Click Here

EOS® Requirement Based on Oil Entrapment by Aquifer Material

25

Summary – How much EOS® do you need?

Suggested Quantity of EOS® for Your Project: 57 drums

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†Exclusive license agreement with Solutions-IES under U.S. Patent # 6,398,960 and several international patents pending.
††EOS® is a registered trademark of EOS Remediation, Inc.

APPENDIX G.5

GROUNDWATER MODELING

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G.5 AT123D MODEL

G.5.1 OVERVIEW

The AT123D, Analytical, Transient One-, Two-, and Three-Dimensional analytical groundwater transport model has been used to evaluate RDX and 2,4,6-TNT attenuation rates in groundwater at SWMU 54 after removal of the remaining soil source at Area A. This model is part of the SEVIEW integrated contaminant transport and fate modeling system developed by Environmental Software Consultants, Inc. (ESC 2007). AT123D computes the spatial-temporal concentration distribution of dissolved phase chemicals in the aquifer system and predicts the transient spread of a contaminant plume through a groundwater aquifer. The fate and transport processes accounted for in AT123D are advection, dispersion, adsorption, and decay. AT123D estimates these components on a monthly basis for up to 99 years of simulation time.

G.5.2 MODEL INPUT PARAMETERS

Various input parameters for aquifer characteristics, source area characteristics, chemical specific properties, and chemical loading were used for model development and implementation as described in the following sections. Table G.5-1 summarizes various site-specific input parameters that were used for the SWMU 54 site.

G.2.1 Aquifer Parameters

ATD123 has input aquifer parameters for aquifer characteristics and geometry including: hydraulic conductivity, hydraulic gradient, effective porosity, soil bulk density, longitudinal, transverse, and vertical dispersivities, aquifer width and depth, number of calculation term values, and model error tolerance. Site specific parameters were used for model input as summarized in Table G.5-1. Model default values were used for vertical dispersivity, number of calculation terms, and error tolerance.

G.2.2 Input Parameters

Model input parameters describe the geometry of the source release and contaminant properties. Site specific parameters were used for the source area size and organic carbon content of the aquifer matrix as summarized in Table G.5-1. Model database parameters were used for chemical properties of RDX and 2,4,6-TNT including organic carbon adsorption coefficient (K_{oc}), distribution coefficient (K_d – calculated using organic carbon content and K_{oc}), and water diffusion coefficient multiplied by tortuosity.

G.2.3 Load Parameters

AT123D load parameters were used to establish an initial concentration within the volume of contaminated groundwater. An instantaneous release load was used to establish initial concentrations in groundwater for RDX and 2,4,6-TNT, which were approximately equal to the maximum concentrations observed during the latest groundwater sampling event conducted in September 2007. The release load was limited to the first 36 months of the model with progressively lower loads over each 12 month period to account for source removal and potential residual loading effects after source removal.

G.5.3 MODEL RESULTS

Model results for RDX and 2,4,6-TNT are summarized in Table G.5-2 and show attenuation of chemical concentrations to levels below their established remedial goals within five years of source removal. A number of factors likely account for the observed attenuation including source removal, the lower initial chemical concentrations present in the aquifer, chemical specific characteristics, and site-specific dispersion factors related to groundwater/surface water interaction occurring at the site.

Table G.5-1
Input Parameters for SWMU 54 AT123D Groundwater Model
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter	Model Input Value	Units	Comment
Aquifer Hydraulic Gradient (Average)	0.0213	ft/ft	Average Value for Area A Section 2.1.4 of RFI/CMS Report
Aquifer Hydraulic Conductivity	4.86	ft/day	Average Value for Area A Section 2.1.7 of RFI/CMS Report (6.172 m/hr)
Effective Porosity	0.20	Unitless	Average Value for Limestone/Sand and Gravel Section 2.72 of RFI/CMS Report
Total Organic Carbon	1%	%	Average Value for Unconsolidated Sediments from RFI/CMS physical test results
Carbon Absorption Coefficient (Koc)	Varies by Chemical	ug/g	From SEVIEW/ATD123 Model Chemical Database
Aquifer Material Bulk Density	1.69	kg/m^3	Average Value for Unconsolidated Sediments from RFI/CMS physical test results
Model Length and Width from Source Area	50	m	Approximate distance from source area to farthest downgradient well adjacent to New River
Dispersivity (Longitudinal)	5	m	1/10 of plume distance
Dispersivity (Lateral)	5	m	1/10 length of observed lateral plume disperson distance (north)
Vertical Dispersivity	0.2	m	ATD123D default value
Source Area Size	2500	ft^2	Estimated area of explosives in soil based on RFI/CMS Data
Source Area Loading	36	months	An instantaneous release load was used to establish initial concentrations in groundwater for RDX and 2,4,6-TNT, which were approximately equal to the maximum concentrations observed during the latest groundwater sampling event conducted in September 2007. The release load was limited to the first 36 months of the model with progressively lower loads over each 12 month period to account for source removal and potential residual loading effects after source removal.

Notes:
ft = feet
ft^2 = square feet
m = meters
TNT = Trinitrotoluene
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazacyclohexane
ug/kg = microgram per gram
mg/L = Milligrams per liter

Table G.5-2
Summary of Groundwater Modeling Results for RDX and 2,4,6-TNT After Removal of Source Area
SWMU 54 RFI/CMS Report
Radford Army Ammunition Plant, Radford, Virginia

RDX - RG = 6.1 µg/L	**RDX Concentrations in µg/L**							
Source Removal at Year 0	MNA Period					Verification of Endpoint		
Year	1	2	3	4	5	6	7	8
Model Predicted with Source Removal	8.1*	3.69	2.23	1.50	1.11	0.86	0.69	0.57

TNT - RG = 7.82 µg/L	**2,4,6-TNT Concentrations in µg/L**							
Source Removal at Year 0	MNA Period					Verification of Endpoint		
Year	1	2	3	4	5	6	7	8
Model Predicted with Source Removal	17.4*	12.2	9.54	7.76	6.45	5.44	4.69	4.18

Notes:
* Approximately Equivalent to the Maximum Groundwater Concentration Detected in September 2007
RG = Established remedial goal in groundwater.
µg/L = Micrograms per liter.
Years 1-5: Monitored Natural Attenuation Period (MNA) estimated in RFI/CMS Report.
Years 6-8: Three Year period to demonstrate achievement and maintenance of endpoints.
red = Concentration Above Remedial Goal

RDX MODEL RUNS

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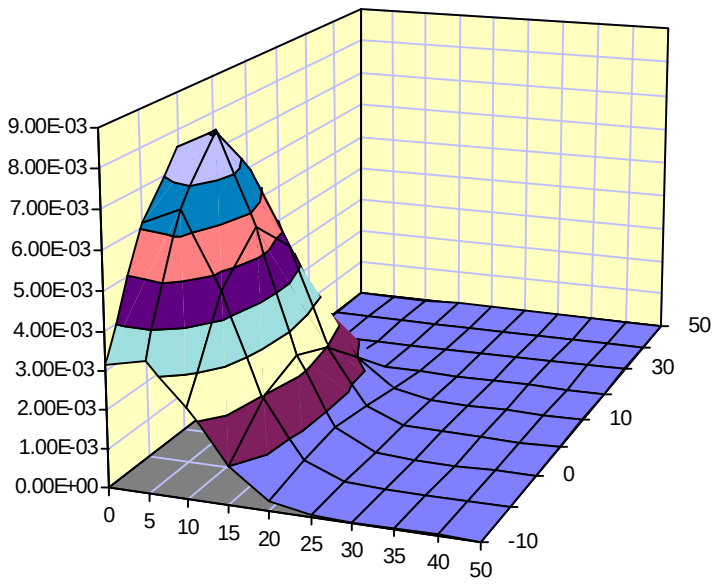
RDX
Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity: 0.200
Hydraulic Gradient: 0.02130 **m/m**
Hydraulic Conductivity: 6.172E-02 **m/hr** 1.714E-03 **cm/sec**
Soil Bulk Density: 1.690E+03 **kg/m3** 1.690E+00 **g/cm3**
Aquifer Width: 0.000E+00 **m** 0.000E+00 **ft**
Aquifer Depth: 0.000E+00 **m** 0.000E+00 **ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content: 1.000E+00 **percent**
Carbon Adsorption Coefficient: 1.950E+02 **(ug/g)/(ug/ml)**
Distribution Coefficient (Kd): 1.950E-03 **m3/kg**
Molecular Diffusion Coefficient: 0.000E+00 **m2/hr**
First-Order Decay Coefficient: 0.000E+00 **1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg)** 0.0000E+
Retardation Factor: 17.480
Retarded Darcy Velocity: 3.761E-04 **m/hr** 1.044E-05 **cm/sec**
Retarded Longitudinal Disp. Cofficient: 1.880E-03 **m2/hr**
Retarded Lateral Dispersion Cofficient: 1.880E-03 **m2/hr**
Retarded Vertical Dispersion Cofficient: 7.522E-06 **m2/hr**

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 365.00 days, 1.00 years.
Maximum concentration of 8.100E-03 mg/l (100.00 percent of the maximum concentration of 8.100E-03 mg/l).

Meters	Feet	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
		0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	3.140E-03	3.350E-03	2.340E-03	1.000E-03	2.380E-04	2.970E-05	1.860E-06	5.700E-08	8.480E-10	
-5.00	-16.42	6.150E-03	6.570E-03	4.590E-03	1.960E-03	4.670E-04	5.810E-05	3.640E-06	1.120E-07	1.660E-09	
0.00	0.00	7.580E-03	8.100E-03	5.660E-03	2.420E-03	5.760E-04	7.170E-05	4.480E-06	1.370E-07	2.050E-09	
5.00	16.42	6.150E-03	6.570E-03	4.590E-03	1.960E-03	4.670E-04	5.810E-05	3.640E-06	1.120E-07	1.660E-09	
10.00	32.83	3.140E-03	3.350E-03	2.340E-03	1.000E-03	2.380E-04	2.970E-05	1.860E-06	5.700E-08	8.480E-10	
20.00	65.67	1.440E-04	1.540E-04	1.070E-04	4.590E-05	1.090E-05	1.360E-06	8.500E-08	2.610E-09	3.880E-11	
30.00	98.50	4.470E-07	4.780E-07	3.340E-07	1.430E-07	3.400E-08	4.230E-09	2.640E-10	8.110E-12	1.210E-13	
40.00	131.33	7.950E-11	8.490E-11	5.940E-11	2.530E-11	6.040E-12	7.510E-13	4.700E-14	1.440E-15	2.150E-17	
50.00	164.17										

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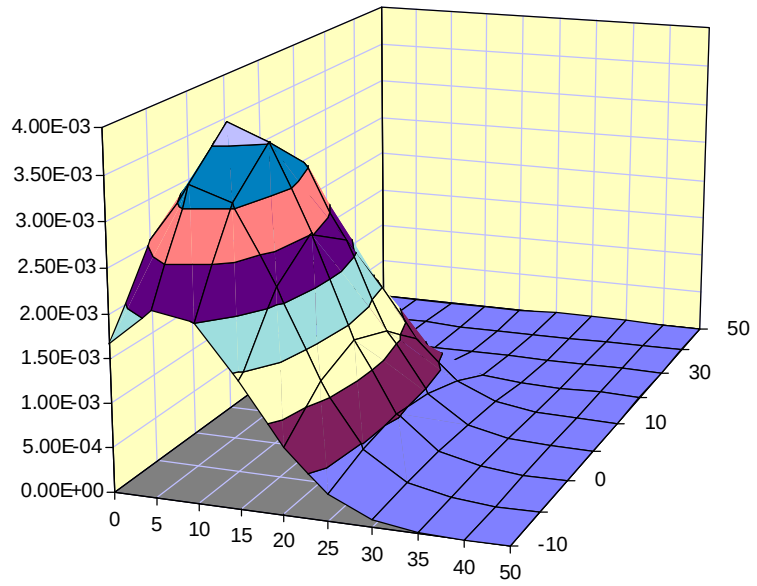
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	**Meters**	**Feet**
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.950E+02	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.950E-03	**m3/kg**
Molecular Diffusion Coefficient:	0.000E+00	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	**Begin (m)**	**End (m)**	**Begin (ft)**	**End(ft)**
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	17.480		
Retarded Darcy Velocity:	3.761E-04	**m/hr**	1.044E-05 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	1.880E-03	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	1.880E-03	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	7.522E-06	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 730.00 days, 2.00 years.
Maximum concentration of 3.690E-03 mg/l (45.56 percent of the maximum concentration of 8.100E-03 mg/l).

Meters	Feet	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
		0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	1.660E-03	2.090E-03	1.990E-03	1.420E-03	7.580E-04	2.970E-04	8.390E-05	1.690E-05	2.420E-06	1.690E-08
-5.00	-16.42	2.550E-03	3.210E-03	3.050E-03	2.180E-03	1.160E-03	4.550E-04	1.290E-04	2.600E-05	3.700E-06	2.580E-08
0.00	0.00	2.930E-03	3.690E-03	3.510E-03	2.510E-03	1.340E-03	5.240E-04	1.480E-04	2.990E-05	4.260E-06	2.970E-08
5.00	16.42	2.550E-03	3.210E-03	3.050E-03	2.180E-03	1.160E-03	4.550E-04	1.290E-04	2.600E-05	3.700E-06	2.580E-08
10.00	32.83	1.660E-03	2.090E-03	1.990E-03	1.420E-03	7.580E-04	2.970E-04	8.390E-05	1.690E-05	2.420E-06	1.690E-08
20.00	65.67	2.840E-04	3.580E-04	3.400E-04	2.430E-04	1.300E-04	5.080E-05	1.440E-05	2.900E-06	4.130E-07	2.880E-09
30.00	98.50	1.310E-05	1.650E-05	1.570E-05	1.120E-05	5.970E-06	2.340E-06	6.610E-07	1.330E-07	1.900E-08	1.330E-10
40.00	131.33	1.490E-07	1.880E-07	1.780E-07	1.270E-07	6.790E-08	2.660E-08	7.520E-09	1.520E-09	2.160E-10	1.510E-12
50.00	164.17	4.010E-10	5.050E-10	4.800E-10	3.430E-10	1.830E-10	7.160E-11	2.020E-11	4.090E-12	5.830E-13	4.070E-15

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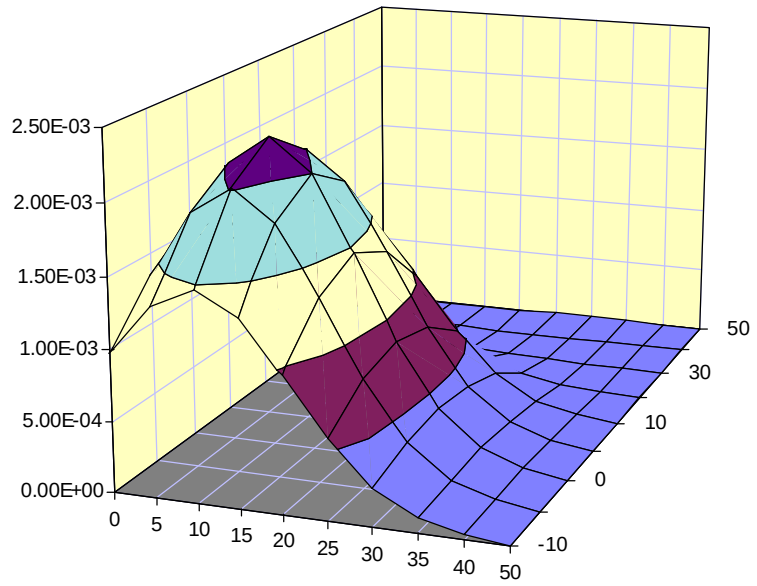
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.950E+02	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.950E-03	**m3/kg**
Molecular Diffusion Coefficient:	0.000E+00	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg):	7.300E+2	**Initial Load (mg/kg):**	0.0000E+
Retardation Factor:	17.480		
Retarded Darcy Velocity:	3.761E-04	**m/hr**	1.044E-05 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	1.880E-03	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	1.880E-03	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	7.522E-06	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 1095.00 days, 3.00 years.
Maximum concentration of 2.230E-03 mg/l (27.53 percent of the maximum concentration of 8.100E-03 mg/l).

Meters	Feet	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
		0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	9.790E-04	1.330E-03	1.470E-03	1.320E-03	9.600E-04	5.660E-04	2.690E-04	1.020E-04	3.100E-05	1.420E-06
-5.00	-16.42	1.340E-03	1.820E-03	2.010E-03	1.800E-03	1.310E-03	7.730E-04	3.670E-04	1.400E-04	4.240E-05	1.940E-06
0.00	0.00	1.480E-03	2.020E-03	2.230E-03	2.000E-03	1.460E-03	8.580E-04	4.070E-04	1.550E-04	4.700E-05	2.160E-06
5.00	16.42	1.340E-03	1.820E-03	2.010E-03	1.800E-03	1.310E-03	7.730E-04	3.670E-04	1.400E-04	4.240E-05	1.940E-06
10.00	32.83	9.790E-04	1.330E-03	1.470E-03	1.320E-03	9.600E-04	5.660E-04	2.690E-04	1.020E-04	3.100E-05	1.420E-06
20.00	65.67	2.770E-04	3.760E-04	4.150E-04	3.730E-04	2.710E-04	1.600E-04	7.590E-05	2.890E-05	8.760E-06	4.020E-07
30.00	98.50	3.230E-05	4.390E-05	4.840E-05	4.350E-05	3.160E-05	1.860E-05	8.850E-06	3.370E-06	1.020E-06	4.690E-08
40.00	131.33	1.500E-06	2.040E-06	2.250E-06	2.020E-06	1.470E-06	8.650E-07	4.110E-07	1.560E-07	4.740E-08	2.180E-09
50.00	164.17	2.690E-08	3.650E-08	4.030E-08	3.620E-08	2.630E-08	1.550E-08	7.370E-09	2.800E-09	8.500E-10	3.900E-11

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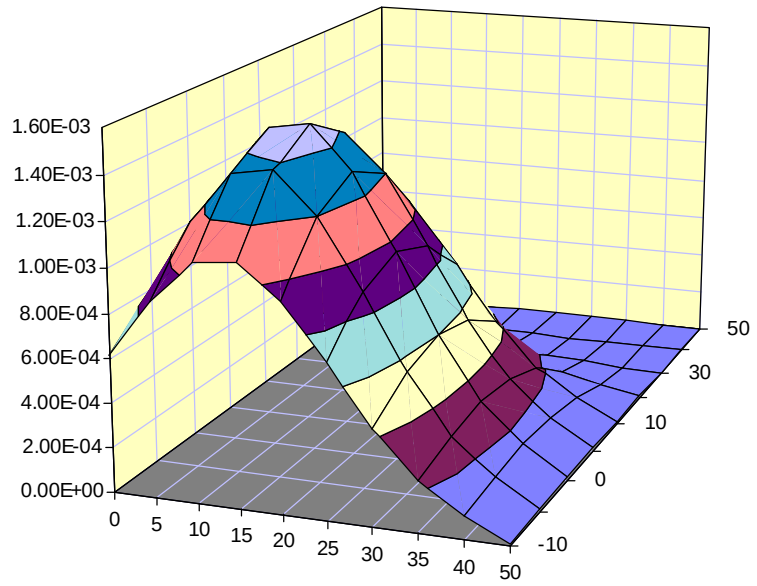
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.950E+02	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.950E-03	**m3/kg**
Molecular Diffusion Coefficient:	0.000E+00	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	17.480			
Retarded Darcy Velocity:	3.761E-04	**m/hr**	1.044E-05	**cm/sec**
Retarded Longitudinal Disp. Cofficient:	1.880E-03	**m2/hr**		
Retarded Lateral Dispersion Cofficient:	1.880E-03	**m2/hr**		
Retarded Vertical Dispersion Cofficient:	7.522E-06	**m2/hr**		

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 1460.00 days, 4.00 years.
Maximum concentration of 1.500E-03 mg/l (18.52 percent of the maximum concentration of 8.100E-03 mg/l).

Meters	Feet	0.00 0.00	5.00 16.42	10.00 32.83	15.00 49.25	20.00 65.67	25.00 82.08	30.00 98.50	35.00 114.92	40.00 131.33	50.00 164.17
-10.00	-32.83	6.180E-04	8.770E-04	1.060E-03	1.080E-03	9.380E-04	6.910E-04	4.310E-04	2.280E-04	1.010E-04	1.200E-05
-5.00	-16.42	7.900E-04	1.120E-03	1.350E-03	1.380E-03	1.200E-03	8.830E-04	5.510E-04	2.910E-04	1.300E-04	1.540E-05
0.00	0.00	8.570E-04	1.220E-03	1.470E-03	1.500E-03	1.300E-03	9.580E-04	5.980E-04	3.160E-04	1.410E-04	1.670E-05
5.00	16.42	7.900E-04	1.120E-03	1.350E-03	1.380E-03	1.200E-03	8.830E-04	5.510E-04	2.910E-04	1.300E-04	1.540E-05
10.00	32.83	6.180E-04	8.770E-04	1.060E-03	1.080E-03	9.380E-04	6.910E-04	4.310E-04	2.280E-04	1.010E-04	1.200E-05
20.00	65.67	2.300E-04	3.270E-04	3.930E-04	4.020E-04	3.490E-04	2.570E-04	1.600E-04	8.470E-05	3.780E-05	4.470E-06
30.00	98.50	4.360E-05	6.190E-05	7.450E-05	7.620E-05	6.610E-05	4.870E-05	3.040E-05	1.610E-05	7.160E-06	8.470E-07
40.00	131.33	4.130E-06	5.870E-06	7.070E-06	7.220E-06	6.270E-06	4.620E-06	2.880E-06	1.520E-06	6.790E-07	8.030E-08
50.00	164.17	1.930E-07	2.740E-07	3.300E-07	3.370E-07	2.930E-07	2.160E-07	1.350E-07	7.110E-08	3.170E-08	3.750E-09

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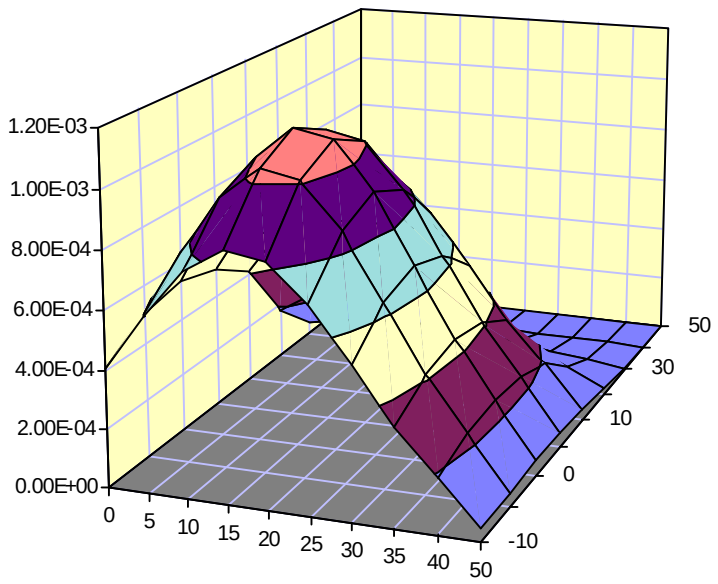
RDX

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+00	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+00	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+00	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.950E+02	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.950E-03	**m3/kg**
Molecular Diffusion Coefficient:	0.000E+00	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg)** 0.0000E+

Retardation Factor:	17.480		
Retarded Darcy Velocity:	3.761E-04	**m/hr**	1.044E-05 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	1.880E-03	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	1.880E-03	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	7.522E-06	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 1825.00 days, 5.00 years.
Maximum concentration of 1.110E-03 mg/l (13.70 percent of the maximum concentration of 8.100E-03 mg/l).

Meters		0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
	Feet	0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	4.090E-04	5.970E-04	7.600E-04	8.460E-04	8.230E-04	6.990E-04	5.190E-04	3.360E-04	1.900E-04	4.010E-05
-5.00	-16.42	5.010E-04	7.300E-04	9.300E-04	1.040E-03	1.010E-03	8.560E-04	6.360E-04	4.120E-04	2.330E-04	4.910E-05
0.00	0.00	5.350E-04	7.810E-04	9.950E-04	1.110E-03	1.080E-03	9.160E-04	6.800E-04	4.410E-04	2.490E-04	5.250E-05
5.00	16.42	5.010E-04	7.300E-04	9.300E-04	1.040E-03	1.010E-03	8.560E-04	6.360E-04	4.120E-04	2.330E-04	4.910E-05
10.00	32.83	4.090E-04	5.970E-04	7.600E-04	8.460E-04	8.230E-04	6.990E-04	5.190E-04	3.360E-04	1.900E-04	4.010E-05
20.00	65.67	1.820E-04	2.650E-04	3.370E-04	3.760E-04	3.650E-04	3.110E-04	2.310E-04	1.490E-04	8.440E-05	1.780E-05
30.00	98.50	4.660E-05	6.790E-05	8.660E-05	9.640E-05	9.370E-05	7.970E-05	5.910E-05	3.830E-05	2.170E-05	4.570E-06
40.00	131.33	6.840E-06	9.980E-06	1.270E-05	1.420E-05	1.380E-05	1.170E-05	8.690E-06	5.630E-06	3.180E-06	6.710E-07
50.00	164.17	5.700E-07	8.310E-07	1.060E-06	1.180E-06	1.150E-06	9.750E-07	7.240E-07	4.690E-07	2.650E-07	5.590E-08

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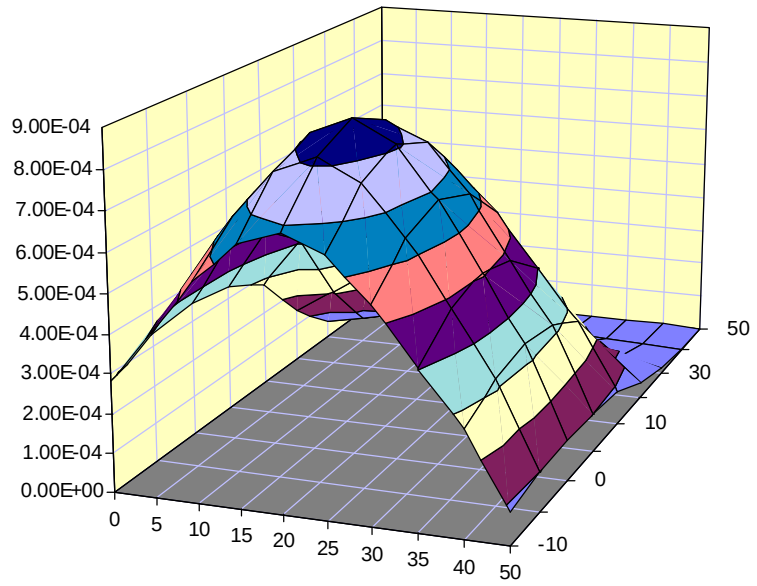
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.950E+02	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.950E-03	**m3/kg**
Molecular Diffusion Coefficient:	0.000E+00	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	17.480		
Retarded Darcy Velocity:	3.761E-04	**m/hr**	1.044E-05 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	1.880E-03	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	1.880E-03	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	7.522E-06	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 2190.00 days, 6.00 years.
Maximum concentration of 8.640E-04 mg/l (10.67 percent of the maximum concentration of 8.100E-03 mg/l).

Meters	Feet	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
		0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	2.800E-04	4.160E-04	5.520E-04	6.520E-04	6.870E-04	6.450E-04	5.400E-04	4.030E-04	2.680E-04	8.390E-05
-5.00	-16.42	3.330E-04	4.950E-04	6.550E-04	7.740E-04	8.160E-04	7.660E-04	6.420E-04	4.790E-04	3.190E-04	9.960E-05
0.00	0.00	3.520E-04	5.240E-04	6.940E-04	8.200E-04	8.640E-04	8.110E-04	6.790E-04	5.070E-04	3.370E-04	1.050E-04
5.00	16.42	3.330E-04	4.950E-04	6.550E-04	7.740E-04	8.160E-04	7.660E-04	6.420E-04	4.790E-04	3.190E-04	9.960E-05
10.00	32.83	2.800E-04	4.160E-04	5.520E-04	6.520E-04	6.870E-04	6.450E-04	5.400E-04	4.030E-04	2.680E-04	8.390E-05
20.00	65.67	1.410E-04	2.090E-04	2.770E-04	3.270E-04	3.450E-04	3.240E-04	2.710E-04	2.020E-04	1.350E-04	4.210E-05
30.00	98.50	4.440E-05	6.610E-05	8.750E-05	1.030E-04	1.090E-04	1.020E-04	8.570E-05	6.400E-05	4.260E-05	1.330E-05
40.00	131.33	8.790E-06	1.310E-05	1.730E-05	2.050E-05	2.150E-05	2.020E-05	1.690E-05	1.270E-05	8.420E-06	2.630E-06
50.00	164.17	1.080E-06	1.610E-06	2.130E-06	2.520E-06	2.650E-06	2.490E-06	2.090E-06	1.560E-06	1.040E-06	3.240E-07

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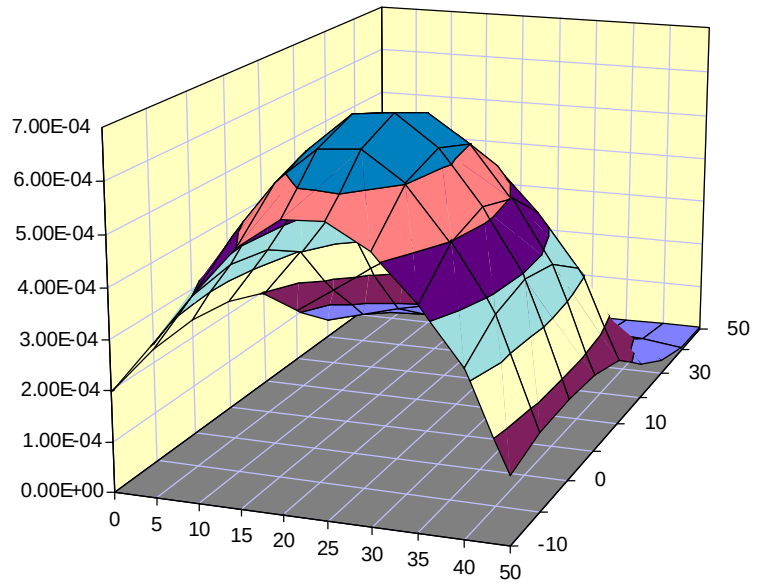
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.950E+02	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.950E-03	**m3/kg**
Molecular Diffusion Coefficient:	0.000E+00	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	17.480		
Retarded Darcy Velocity:	3.761E-04	**m/hr**	1.044E-05 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	1.880E-03	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	1.880E-03	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	7.522E-06	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 2555.00 days, 7.00 years.
Maximum concentration of 6.900E-04 mg/l (8.52 percent of the maximum concentration of 8.100E-03 mg/l).

Meters		0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
	Feet	0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	1.970E-04	2.970E-04	4.050E-04	5.000E-04	5.590E-04	5.650E-04	5.170E-04	4.280E-04	3.210E-04	1.340E-04
-5.00	-16.42	2.290E-04	3.450E-04	4.700E-04	5.810E-04	6.490E-04	6.560E-04	6.010E-04	4.980E-04	3.730E-04	1.550E-04
0.00	0.00	2.400E-04	3.620E-04	4.940E-04	6.100E-04	6.820E-04	6.900E-04	6.310E-04	5.230E-04	3.920E-04	1.630E-04
5.00	16.42	2.290E-04	3.450E-04	4.700E-04	5.810E-04	6.490E-04	6.560E-04	6.010E-04	4.980E-04	3.730E-04	1.550E-04
10.00	32.83	1.970E-04	2.970E-04	4.050E-04	5.000E-04	5.590E-04	5.650E-04	5.170E-04	4.280E-04	3.210E-04	1.340E-04
20.00	65.67	1.080E-04	1.630E-04	2.230E-04	2.750E-04	3.070E-04	3.110E-04	2.840E-04	2.350E-04	1.770E-04	7.350E-05
30.00	98.50	3.980E-05	6.010E-05	8.190E-05	1.010E-04	1.130E-04	1.140E-04	1.050E-04	8.660E-05	6.500E-05	2.700E-05
40.00	131.33	9.780E-06	1.480E-05	2.010E-05	2.480E-05	2.770E-05	2.810E-05	2.570E-05	2.130E-05	1.600E-05	6.640E-06
50.00	164.17	1.600E-06	2.410E-06	3.290E-06	4.060E-06	4.530E-06	4.590E-06	4.200E-06	3.480E-06	2.610E-06	1.080E-06

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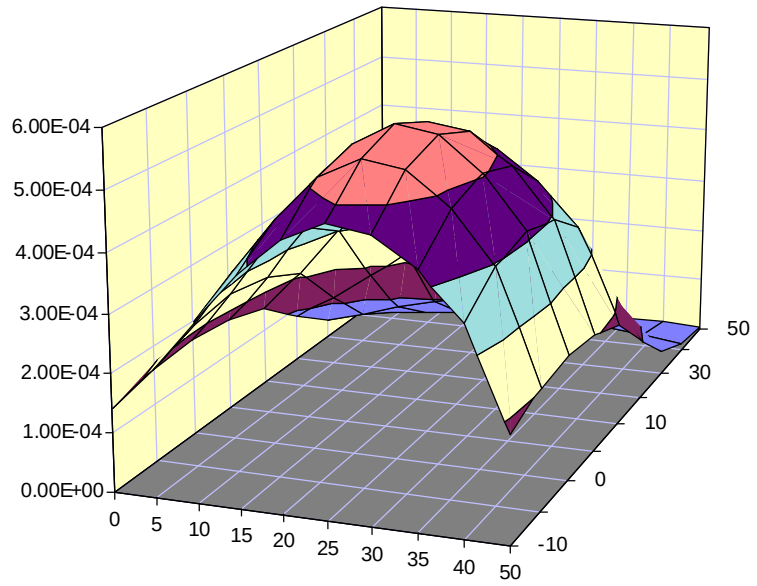
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.950E+02	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.950E-03	**m3/kg**
Molecular Diffusion Coefficient:	0.000E+00	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	17.480		
Retarded Darcy Velocity:	3.761E-04	**m/hr**	1.044E-05 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	1.880E-03	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	1.880E-03	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	7.522E-06	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 2920.00 days, 8.00 years.
Maximum concentration of 5.730E-04 mg/l (7.07 percent of the maximum concentration of 8.100E-03 mg/l).

Meters	Feet	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
		0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	1.410E-04	2.150E-04	3.010E-04	3.840E-04	4.490E-04	4.800E-04	4.710E-04	4.220E-04	3.470E-04	1.800E-04
-5.00	-16.42	1.610E-04	2.460E-04	3.430E-04	4.380E-04	5.120E-04	5.480E-04	5.370E-04	4.820E-04	3.960E-04	2.050E-04
0.00	0.00	1.690E-04	2.570E-04	3.580E-04	4.580E-04	5.350E-04	5.730E-04	5.610E-04	5.040E-04	4.140E-04	2.140E-04
5.00	16.42	1.610E-04	2.460E-04	3.430E-04	4.380E-04	5.120E-04	5.480E-04	5.370E-04	4.820E-04	3.960E-04	2.050E-04
10.00	32.83	1.410E-04	2.150E-04	3.010E-04	3.840E-04	4.490E-04	4.800E-04	4.710E-04	4.220E-04	3.470E-04	1.800E-04
20.00	65.67	8.330E-05	1.270E-04	1.770E-04	2.260E-04	2.640E-04	2.830E-04	2.770E-04	2.490E-04	2.040E-04	1.060E-04
30.00	98.50	3.440E-05	5.250E-05	7.320E-05	9.350E-05	1.090E-04	1.170E-04	1.150E-04	1.030E-04	8.450E-05	4.380E-05
40.00	131.33	9.980E-06	1.520E-05	2.120E-05	2.710E-05	3.160E-05	3.390E-05	3.320E-05	2.980E-05	2.450E-05	1.270E-05
50.00	164.17	2.020E-06	3.080E-06	4.290E-06	5.480E-06	6.410E-06	6.860E-06	6.720E-06	6.030E-06	4.960E-06	2.570E-06

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2,4,6-TNT MODEL RUNS

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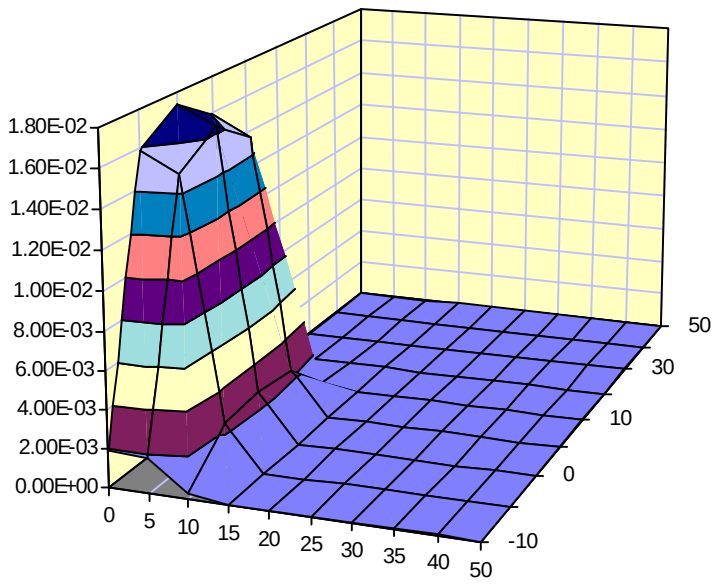
Trinitrotoluene, 2,4,6-

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+00	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+00	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+00	**ft**

Dispersivities	**Meters**	**Feet**
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.834E+01	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.834E-02	**m3/kg**
Molecular Diffusion Coefficient:	2.289E-06	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	**Begin (m)**	**End (m)**	**Begin (ft)**	**End(ft)**
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg)** 0.0000E+
Retardation Factor: 156.000

Retarded Darcy Velocity:	4.214E-05	**m/hr**	1.170E-06 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	2.108E-04	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	2.108E-04	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	9.162E-07	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 365.00 days, 1.00 years.
Maximum concentration of 1.740E-02 mg/l (100.00 percent of the maximum concentration of 1.740E-02 mg/l).

Meters		0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
	Feet	0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	1.870E-03	1.760E-03	2.750E-04	2.440E-07						
-5.00	-16.42	1.590E-02	1.490E-02	2.340E-03	2.080E-06						
0.00	0.00	1.740E-02	1.640E-02	2.560E-03	2.280E-06						
5.00	16.42	1.590E-02	1.490E-02	2.340E-03	2.080E-06						
10.00	32.83	1.870E-03	1.760E-03	2.750E-04	2.440E-07						
20.00	65.67										
30.00	98.50										
40.00	131.33										
50.00	164.17										

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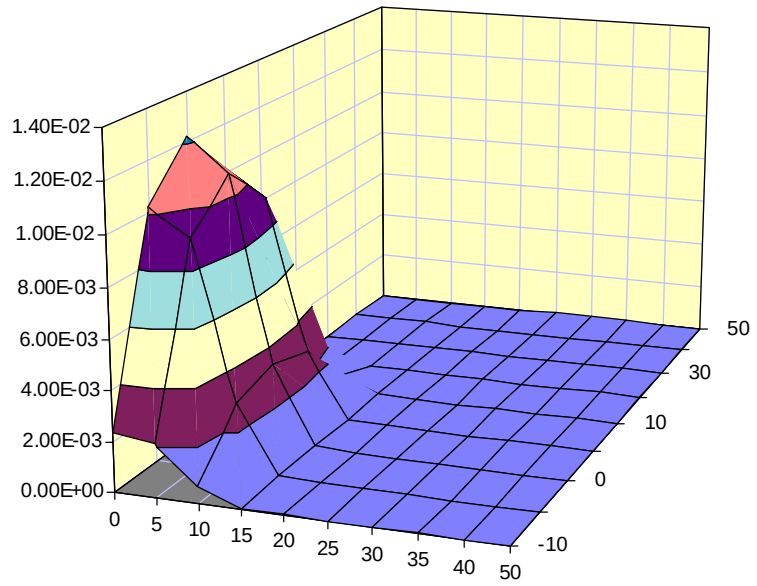
Trinitrotoluene, 2,4,6-

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.834E+01	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.834E-02	**m3/kg**
Molecular Diffusion Coefficient:	2.289E-06	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	156.000		
Retarded Darcy Velocity:	4.214E-05	**m/hr**	1.170E-06 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	2.108E-04	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	2.108E-04	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	9.162E-07	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 730.00 days, 2.00 years.
Maximum concentration of 1.220E-02 mg/l (70.11 percent of the maximum concentration of 1.740E-02 mg/l).

Meters	Feet	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
		0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	2.320E-03	2.090E-03	6.370E-04	1.690E-05	2.130E-08					
-5.00	-16.42	1.020E-02	9.130E-03	2.790E-03	7.400E-05	9.340E-08					
0.00	0.00	1.220E-02	1.090E-02	3.330E-03	8.850E-05	1.120E-07					
5.00	16.42	1.020E-02	9.130E-03	2.790E-03	7.400E-05	9.340E-08					
10.00	32.83	2.320E-03	2.090E-03	6.370E-04	1.690E-05	2.130E-08					
20.00	65.67	3.170E-08	2.840E-08	8.690E-09	2.310E-10	2.910E-13					
30.00	98.50										
40.00	131.33										
50.00	164.17										

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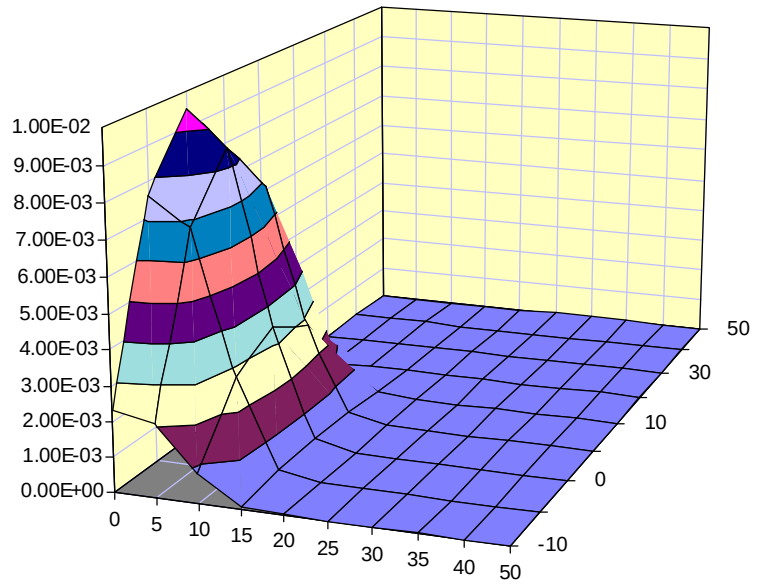
Trinitrotoluene, 2,4,6-

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.834E+01	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.834E-02	**m3/kg**
Molecular Diffusion Coefficient:	2.289E-06	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	156.000		
Retarded Darcy Velocity:	4.214E-05	**m/hr**	1.170E-06 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	2.108E-04	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	2.108E-04	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	9.162E-07	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 1095.00 days, 3.00 years.
Maximum concentration of 9.540E-03 mg/l (54.83 percent of the maximum concentration of 1.740E-02 mg/l).

Meters	Feet	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
		0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	2.310E-03	2.070E-03	8.340E-04	7.060E-05	8.370E-07	1.200E-09				
-5.00	-16.42	7.640E-03	6.840E-03	2.760E-03	2.340E-04	2.770E-06	3.970E-09				
0.00	0.00	9.540E-03	8.530E-03	3.450E-03	2.910E-04	3.460E-06	4.950E-09				
5.00	16.42	7.640E-03	6.840E-03	2.760E-03	2.340E-04	2.770E-06	3.970E-09				
10.00	32.83	2.310E-03	2.070E-03	8.340E-04	7.060E-05	8.370E-07	1.200E-09				
20.00	65.67	9.680E-07	8.660E-07	3.500E-07	2.960E-08	3.510E-10	5.030E-13				
30.00	98.50										
40.00	131.33										
50.00	164.17										

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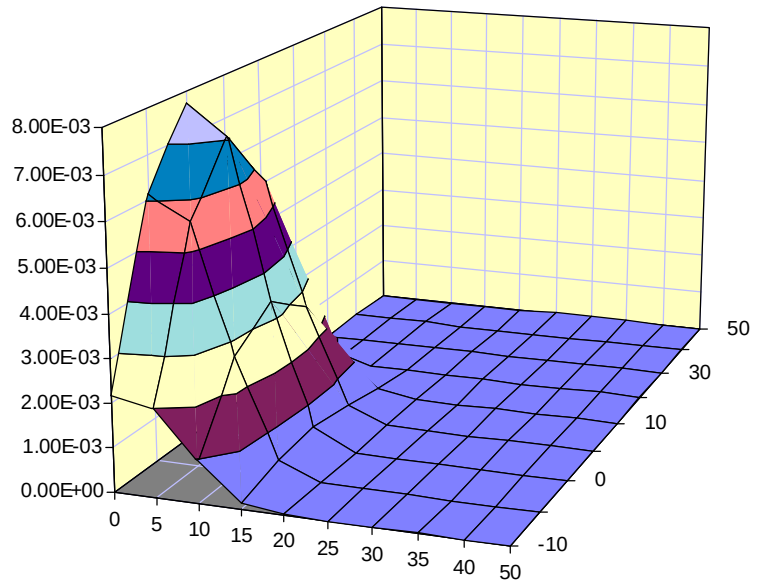
Trinitrotoluene, 2,4,6-

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.834E+01	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.834E-02	**m3/kg**
Molecular Diffusion Coefficient:	2.289E-06	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	156.000		
Retarded Darcy Velocity:	4.214E-05	**m/hr**	1.170E-06 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	2.108E-04	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	2.108E-04	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	9.162E-07	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 1460.00 days, 4.00 years.
Maximum concentration of 7.760E-03 mg/l (44.60 percent of the maximum concentration of 1.740E-02 mg/l).

Meters	Feet	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
		0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	2.180E-03	1.990E-03	9.460E-04	1.450E-04	5.280E-06	4.060E-08	6.260E-11			
-5.00	-16.42	6.120E-03	5.590E-03	2.660E-03	4.060E-04	1.480E-05	1.140E-07	1.760E-10			
0.00	0.00	7.760E-03	7.080E-03	3.370E-03	5.150E-04	1.880E-05	1.450E-07	2.230E-10			
5.00	16.42	6.120E-03	5.590E-03	2.660E-03	4.060E-04	1.480E-05	1.140E-07	1.760E-10			
10.00	32.83	2.180E-03	1.990E-03	9.460E-04	1.450E-04	5.280E-06	4.060E-08	6.260E-11			
20.00	65.67	5.180E-06	4.730E-06	2.250E-06	3.440E-07	1.260E-08	9.650E-11	1.490E-13			
30.00	98.50										
40.00	131.33										
50.00	164.17										

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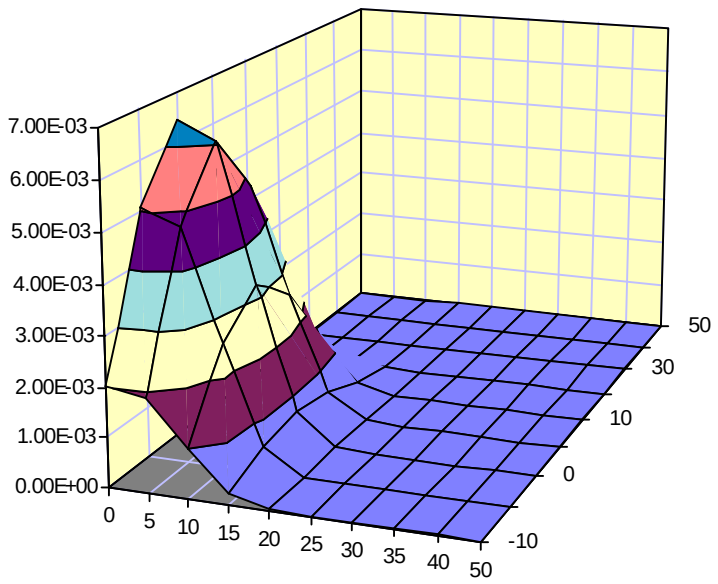
Trinitrotoluene, 2,4,6-

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity: 0.200
Hydraulic Gradient: 0.02130 **m/m**
Hydraulic Conductivity: 6.172E-02 **m/hr** 1.714E-03 **cm/sec**
Soil Bulk Density: 1.690E+03 **kg/m3** 1.690E+00 **g/cm3**
Aquifer Width: 0.000E+00 **m** 0.000E+00 **ft**
Aquifer Depth: 0.000E+00 **m** 0.000E+00 **ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content: 1.000E+00 **percent**
Carbon Adsorption Coefficient: 1.834E+01 **(ug/g)/(ug/ml)**
Distribution Coefficient (Kd): 1.834E-02 **m3/kg**
Molecular Diffusion Coefficient: 2.289E-06 **m2/hr**
First-Order Decay Coefficient: 0.000E+00 **1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg)** 0.0000E+
Retardation Factor: 156.000
Retarded Darcy Velocity: 4.214E-05 **m/hr** 1.170E-06 **cm/sec**
Retarded Longitudinal Disp. Cofficient: 2.108E-04 **m2/hr**
Retarded Lateral Dispersion Cofficient: 2.108E-04 **m2/hr**
Retarded Vertical Dispersion Cofficient: 9.162E-07 **m2/hr**

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 1825.00 days, 5.00 years.
Maximum concentration of 6.450E-03 mg/l (37.07 percent of the maximum concentration of 1.740E-02 mg/l).

Meters		0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
	Feet	0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	2.020E-03	1.900E-03	1.010E-03	2.220E-04	1.600E-05	3.370E-07	1.980E-09			
-5.00	-16.42	5.070E-03	4.780E-03	2.550E-03	5.580E-04	4.010E-05	8.460E-07	4.970E-09			
0.00	0.00	6.450E-03	6.070E-03	3.240E-03	7.100E-04	5.100E-05	1.070E-06	6.310E-09			
5.00	16.42	5.070E-03	4.780E-03	2.550E-03	5.580E-04	4.010E-05	8.460E-07	4.970E-09			
10.00	32.83	2.020E-03	1.900E-03	1.010E-03	2.220E-04	1.600E-05	3.370E-07	1.980E-09			
20.00	65.67	1.380E-05	1.300E-05	6.920E-06	1.520E-06	1.090E-07	2.300E-09	1.350E-11			
30.00	98.50	6.640E-10	6.260E-10	3.330E-10	7.310E-11	5.250E-12	1.110E-13	6.500E-16			
40.00	131.33										
50.00	164.17										

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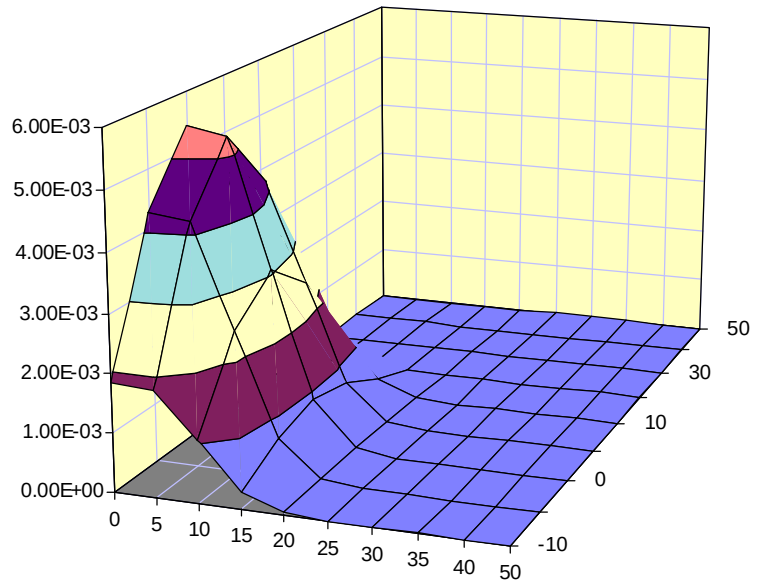
Trinitrotoluene, 2,4,6-

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.834E+01	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.834E-02	**m3/kg**
Molecular Diffusion Coefficient:	2.289E-06	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	156.000		
Retarded Darcy Velocity:	4.214E-05	**m/hr**	1.170E-06 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	2.108E-04	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	2.108E-04	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	9.162E-07	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 2190.00 days, 6.00 years.
Maximum concentration of 5.440E-03 mg/l (31.26 percent of the maximum concentration of 1.740E-02 mg/l).

Meters		0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
	Feet	0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	1.860E-03	1.810E-03	1.060E-03	2.960E-04	3.340E-05	1.380E-06	1.990E-08	9.790E-11		
-5.00	-16.42	4.300E-03	4.190E-03	2.440E-03	6.830E-04	7.720E-05	3.190E-06	4.590E-08	2.260E-10		
0.00	0.00	5.440E-03	5.300E-03	3.080E-03	8.640E-04	9.770E-05	4.040E-06	5.810E-08	2.860E-10		
5.00	16.42	4.300E-03	4.190E-03	2.440E-03	6.830E-04	7.720E-05	3.190E-06	4.590E-08	2.260E-10		
10.00	32.83	1.860E-03	1.810E-03	1.060E-03	2.960E-04	3.340E-05	1.380E-06	1.990E-08	9.790E-11		
20.00	65.67	2.590E-05	2.520E-05	1.470E-05	4.110E-06	4.650E-07	1.920E-08	2.760E-10	1.360E-12		
30.00	98.50	6.020E-09	5.870E-09	3.410E-09	9.570E-10	1.080E-10	4.470E-12	6.430E-14	3.170E-16		
40.00	131.33										
50.00	164.17										

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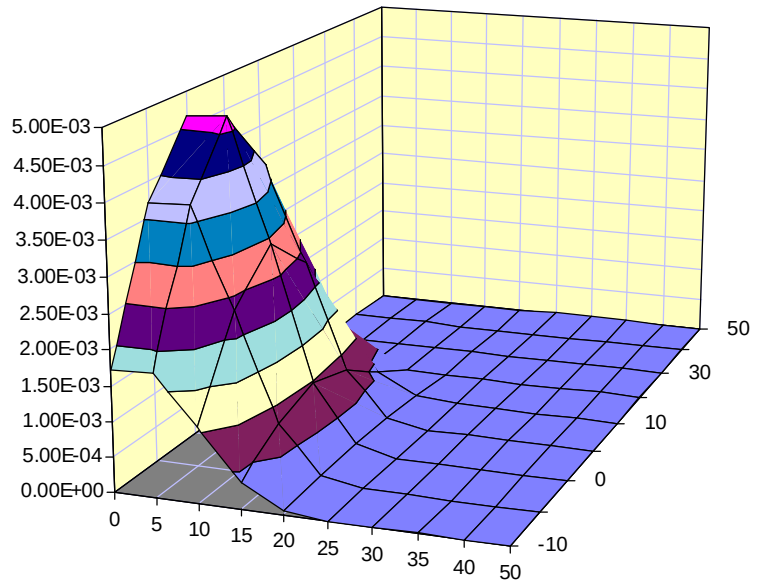
Trinitrotoluene, 2,4,6-

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.834E+01	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.834E-02	**m3/kg**
Molecular Diffusion Coefficient:	2.289E-06	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	156.000		
Retarded Darcy Velocity:	4.214E-05	**m/hr**	1.170E-06 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	2.108E-04	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	2.108E-04	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	9.162E-07	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 2555.00 days, 7.00 years.
Maximum concentration of 4.690E-03 mg/l (26.95 percent of the maximum concentration of 1.740E-02 mg/l).

Meters	Feet	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
		0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	1.710E-03	1.730E-03	1.080E-03	3.620E-04	5.660E-05	3.780E-06	1.030E-07	1.130E-09		
-5.00	-16.42	3.710E-03	3.730E-03	2.330E-03	7.830E-04	1.220E-04	8.180E-06	2.230E-07	2.440E-09		
0.00	0.00	4.650E-03	4.690E-03	2.930E-03	9.830E-04	1.540E-04	1.030E-05	2.800E-07	3.060E-09		
5.00	16.42	3.710E-03	3.730E-03	2.330E-03	7.830E-04	1.220E-04	8.180E-06	2.230E-07	2.440E-09		
10.00	32.83	1.710E-03	1.730E-03	1.080E-03	3.620E-04	5.660E-05	3.780E-06	1.030E-07	1.130E-09		
20.00	65.67	3.990E-05	4.020E-05	2.510E-05	8.430E-06	1.320E-06	8.800E-08	2.410E-09	2.620E-11		
30.00	98.50	2.870E-08	2.890E-08	1.810E-08	6.070E-09	9.480E-10	6.340E-11	1.730E-12	1.890E-14		
40.00	131.33										
50.00	164.17										

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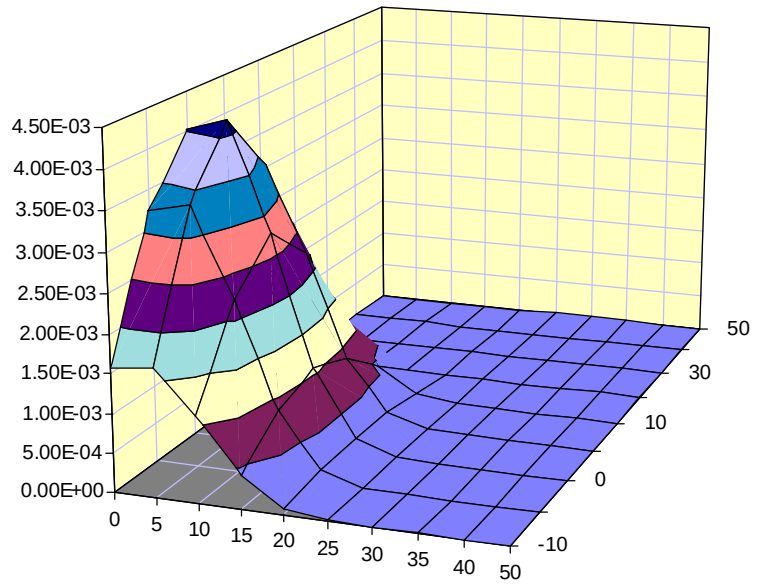
Trinitrotoluene, 2,4,6-

Dissolved Concentrations in Plume



AT123D INPUT PARAMETERS

Effective Porosity:	0.200			
Hydraulic Gradient:	0.02130	**m/m**		
Hydraulic Conductivity:	6.172E-02	**m/hr**	1.714E-03	**cm/sec**
Soil Bulk Density:	1.690E+03	**kg/m3**	1.690E+0	**g/cm3**
Aquifer Width:	0.000E+00	**m**	0.000E+0	**ft**
Aquifer Depth:	0.000E+00	**m**	0.000E+0	**ft**

Dispersivities	Meters	Feet
Longitudinal:	5.00	16.42
Lateral:	5.00	16.42
Vertical:	0.02	0.07

Soil Organic Carbon Content:	1.000E+00	**percent**
Carbon Adsorption Coefficient:	1.834E+01	**(ug/g)/(ug/ml)**
Distribution Coefficient (Kd):	1.834E-02	**m3/kg**
Molecular Diffusion Coefficient:	2.289E-06	**m2/hr**
First-Order Decay Coefficient:	0.000E+00	**1/hr**

Load	Begin (m)	End (m)	Begin (ft)	End(ft)
X-Direction	-7.615	7.615	-25.003	25.003
Y-Direction	-7.615	7.615	-25.003	25.003
Z-Direction	0.000	0.000	0.000	0.000

Initial Load (kg): 7.300E+2 **Initial Load (mg/kg):** 0.0000E+

Retardation Factor:	156.000		
Retarded Darcy Velocity:	4.214E-05	**m/hr**	1.170E-06 **cm/sec**
Retarded Longitudinal Disp. Cofficient:	2.108E-04	**m2/hr**	
Retarded Lateral Dispersion Cofficient:	2.108E-04	**m2/hr**	
Retarded Vertical Dispersion Cofficient:	9.162E-07	**m2/hr**	

Depth (Z) = 0.00 meters, 0.00 feet.
Distribution in mg/l at 2920.00 days, 8.00 years.
Maximum concentration of 4.180E-03 mg/l (24.02 percent of the maximum concentration of 1.740E-02 mg/l).

Meters	Feet	0.00	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	50.00
		0.00	16.42	32.83	49.25	65.67	82.08	98.50	114.92	131.33	164.17
-10.00	-32.83	1.580E-03	1.640E-03	1.090E-03	4.210E-04	8.390E-05	8.050E-06	3.550E-07	7.060E-09	6.290E-11	
-5.00	-16.42	3.230E-03	3.360E-03	2.230E-03	8.610E-04	1.720E-04	1.650E-05	7.270E-07	1.450E-08	1.290E-10	
0.00	0.00	4.020E-03	4.180E-03	2.780E-03	1.070E-03	2.130E-04	2.050E-05	9.040E-07	1.800E-08	1.600E-10	
5.00	16.42	3.230E-03	3.360E-03	2.230E-03	8.610E-04	1.720E-04	1.650E-05	7.270E-07	1.450E-08	1.290E-10	
10.00	32.83	1.580E-03	1.640E-03	1.090E-03	4.210E-04	8.390E-05	8.050E-06	3.550E-07	7.060E-09	6.290E-11	
20.00	65.67	5.440E-05	5.650E-05	3.760E-05	1.450E-05	2.890E-06	2.770E-07	1.220E-08	2.430E-10	2.160E-12	
30.00	98.50	9.140E-08	9.510E-08	6.320E-08	2.430E-08	4.860E-09	4.660E-10	2.060E-11	4.090E-13	3.640E-15	
40.00	131.33										
50.00	164.17										

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APPENDIX H

DATA VALIDATION REPORTS AND LABORATORY ANALYTICAL DATA (FORM I)

APPENDIX H.1
SWMU 54 Initial Sampling Event
2002-2003

APPENDIX H.2
Additional Characterization Work Instructions Sampling
2004

APPENDIX H.3
Additional Investigations and Quarterly Groundwater Monitoring
2006-2007

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APPENDIX H.1
SWMU 54 Initial Sampling Event
2002-2003

DATA VALIDATION REPORT - Level III Review

SDG No.: _____A2810_____ **Fraction:**_SVOCs, PAH, Explosives, Nitroglycerin & Metals__

Lab: _CompuChem_____ **Project Name:** __Radford SWMU 54_____

Reviewer: _____RA_____ **Date:** _____April 18, 2003_____

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: For the SVOC analyses, the initial calibration analyzed on 3/5/03 displayed %RSDs greater than the control limit (i.e., 15%) for benzaldehyde at 21.59%, phenol at 19.70%, bis(2-chloroethyl)ether at 18.25%, 2,2-oxybis(1-chloropropane) at 16.51%, n-nitroso-di-n-propylamine at 17.81%, nitrobenzene at 15.11%, 2,4-dimethylphenol at 15.92%, bis (2-chloroethoxy)methane at 18.54%, naphthalene at 19.02%, 4-chloroaniline at 16.07%, 4-chloro-3-methylphenol at 15.91%, 2-methylnaphthalene at 16.16%, hexachlorocyclopentadiene at 21.09%, 2,4,5-trichlorophenol at 15.75%, 1,1-biphenyl at 15.79%, 2-nitroaniline at 21.22%, acenaphthylene at 18.09%, 3-nitroaniline at 19.84%, acenaphthene at 20.76%, dibenzofuran at 16.84%, fluorene at 18.10%, 4-nitroaniline at 18.18%, n-nitrosodiphenylamine at 17.80%, and atrazine at 15.40%. No positive results were reported and no data qualifying action was required since the failures were not serious enough (i.e., > 50%) to affect the non-detects.

The CCV analyzed on 3/6/03 at 2320 displayed a %D greater than the control limit (i.e., 20%) with a negative bias for 4,6-dinitro-2-methylphenol at 20.59%. Non-detects were flagged "UJ,c" in the associated samples.

For the PAH analyses, the RPD for the MS/MSD analyses of sample 54MW5 was greater than the QC limit (i.e., 20%) for fluoranthene at 22%. No positive results were reported in the parent sample and no data qualifying action was required.

For the explosives analyses, the continuing calibration analyzed on 3/6/03 at 1345 displayed %Ds greater than the QC limit (i.e., 15%) with a positive bias for RDX at 23.67%, 2-nitrotoluene at 20.85%, 3-nitrotoluene at 21.15%, and 4-nitrotoluene at 22.48% on the initial column. The continuing calibration analyzed on 3/12/03 at 1221 displayed a %D greater than the QC limit with a positive bias for 2,6-dinitrotoluene at 17.26% on the second column. The continuing calibration

analyzed on 3/12/03 at 2329 displayed %Ds greater than the QC limit with a positive bias for 2,6-dinitrotoluene at 17.38%, 2-nitrotoluene at 16.31% and 4-nitrotoluene at 16.31% on the second column. No positive results were reported in the associated samples. No data qualifying action was taken for the non-detects since the %Ds were acceptable on the alternate column.

The MSD recovery for HMX (45%) was less than the lower QC limit. The associated sample result was positive in the parent sample 54MW5 and was flagged "J,m."

The RPDs between the two analytical columns were greater than the QC limit (i.e., 40%) for 4-amino-2,6-dinitrotoluene in sample 54MW2 (54%) and 54MW3 (73.7%) and HMX in sample 54MW7 (69.7%). These results were flagged "J,g." The higher results were reported by the laboratory.

For the metal analyses, the initial CRDL percent recoveries for cadmium (113.2%), lead (82.3%), potassium (65.4%), selenium (118%), thallium (71.1%), and zinc (72.1%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "L,w" and non-detects were flagged "UL,w" for lead, potassium, thallium, and zinc in the associated samples. All associated sample results were either non-detect or were previously flagged for cadmium and selenium, and no further data qualifying action was required.

The method blank displayed negative results for calcium and zinc and a positive result for selenium. Positive selenium results less than 5 times the blank concentration were flagged "B,p" in the associated samples. Positive zinc results were previously flagged due to CRDL anomalies and no further data qualifying action was taken. Positive calcium results were greater than 5 times the absolute value of the blank concentration and no data qualifying action was required.

The initial and continuing calibration blanks also displayed positive results for iron, manganese and magnesium; and negative results for calcium, lead, sodium, and zinc. Positive iron and manganese results less than 5 times the blank concentration were flagged "B,o" in the associated samples. Positive sodium results less than 5 times the absolute value of the blank concentration were flagged "L,o" in the associated samples. All associated sample results were either greater than 5 times the blank concentration or were previously flagged due to other anomalies for the other analytes and no further data qualifying action was required.

Equipment blank GW-EB-1 contained aluminum at 37.6 ug/L, barium at 0.33 ug/L, chromium at 3.5 ug/L, cobalt at 3 ug/L and sodium at 529 ug/L. Equipment blank GW-EB-2 contained sodium at 386 ug/L. Positive results less than 5 times the blank concentration were flagged "B,x" in the associated samples.

The MS/MSD recoveries analyzed on sample 54MW5 were outside the QC limit for selenium (125.7%/125.9%) and thallium (59.9%/63.1%). All associated sample results were previously flagged due to other anomalies and no further data qualifying action was required.

The RPD for manganese (32%) was greater than the QC limit (i.e., 25%) for the field duplicate pair 54MW7/GW-DUP-1. No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

Correctable Anomalies: None.

Comments: Positive TIC results were flagged "NJ,t" in the associated samples. All unknown hits were removed from TIC summary forms by the reviewer. It should be noted that if a given fraction (analysis) is not discussed in this report, it indicates that no anomalies were observed for that fraction. All data, as qualified, are usable for their intended purpose based on the data reviewed.

Signed: Ranjan

SAMPLENUM	CLIENTID	QUOTENUMREF	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
A2810-5	54MW2	Q2810	A2810	WA	URS	RADFORD SWMU 54	3/5/03
A2810-6	54MW3	Q2810	A2810	WA	URS	RADFORD SWMU 54	3/5/03
A2810-7	54MW4	Q2810	A2810	WA	URS	RADFORD SWMU 54	3/5/03
A2810-8	54MW5	Q2810	A2810	WA	URS	RADFORD SWMU 54	3/5/03
A2810-2	54MW6	Q2810	A2810	WA	URS	RADFORD SWMU 54	3/4/03
A2810-9	54MW7	Q2810	A2810	WA	URS	RADFORD SWMU 54	3/5/03
A2810-3	GW-DUP-1	Q2810	A2810	WA	URS	RADFORD SWMU 54	3/5/03
A2810-1	GW-EB-1	Q2810	A2810	WA	URS	RADFORD SWMU 54	3/4/03
A2810-4	GW-EB-2	Q2810	A2810	WA	URS	RADFORD SWMU 54	3/5/03

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-5

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-5B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-5

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-5B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	2	J
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U UJ,C
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54MW2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-5

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-5B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-6

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-6B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-6

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-6B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	3	J
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U UJ,C
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54MW3

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-6

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-6B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.78	4	JB
2.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	10.68	15	NJ
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
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NJ

FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-7

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-7B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-7

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-7B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	UUJ,C
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	2	J
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54MW4

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-7

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-7B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-8

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-8B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-8

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-8B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	UUJ,C
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54MW5

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-8

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-8B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.70~~	~~4~~	~~JB~~
2.					
3.					
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW6

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-2

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-2B64

Level: (low/med) LOW Date Received: 03/04/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW6

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-2

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-2B64

Level: (low/med) LOW Date Received: 03/04/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U UJ,C
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54MW6

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-2

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-2B64

Level: (low/med) LOW Date Received: 03/04/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW7

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-9

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-9B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54MW7

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-9

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-9B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U UJ, C
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54MW7

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-9

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-9B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GW-DUP-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-3B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GW-DUP-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-3B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
51-28-5	2,4-Dinitrophenol	50	U	
100-02-7	4-Nitrophenol	20	U	
121-14-2	2,4-Dinitrotoluene	10	U	
132-64-9	Dibenzofuran	10	U	
84-66-2	Diethylphthalate	10	U	
7005-72-3	4-Chlorophenyl-phenylether	10	U	
86-73-7	Fluorene	10	U	
100-01-6	4-Nitroaniline	20	U	
534-52-1	4,6-Dinitro-2-methylphenol	20	U	UJ/C
86-30-6	N-Nitrosodiphenylamine (1)	10	U	
101-55-3	4-Bromophenyl-phenylether	10	U	
118-74-1	Hexachlorobenzene	10	U	
1912-24-9	Atrazine	10	U	
87-86-5	Pentachlorophenol	20	U	
85-01-8	Phenanthrene	10	U	
120-12-7	Anthracene	10	U	
86-74-8	Carbazole	10	U	
84-74-2	Di-n-butylphthalate	10	U	
206-44-0	Fluoranthene	10	U	
129-00-0	Pyrene	10	U	
85-68-7	Butylbenzylphthalate	10	U	
91-94-1	3,3'-Dichlorobenzidine	10	U	
117-81-7	bis(2-ethylhexyl)Phthalate	10	U	
56-55-3	Benzo(a)anthracene	10	U	
218-01-9	Chrysene	10	U	
117-84-0	Di-n-octylphthalate	10	U	
205-99-2	Benzo(b)fluoranthene	10	U	
207-08-9	Benzo(k)fluoranthene	10	U	
50-32-8	Benzo(a)pyrene	10	U	
193-39-5	Indeno(1,2,3-cd)pyrene	10	U	
53-70-3	Dibenzo(a,h)anthracene	10	U	
191-24-2	Benzo(g,h,i)perylene	10	U	

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW-DUP-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-3B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GW-EB-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-1B64

Level: (low/med) LOW Date Received: 03/04/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GW-EB-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-1B64

Level: (low/med) LOW Date Received: 03/04/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U UJ, C
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW-EB-1

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-1B64

Level: (low/med) LOW Date Received: 03/04/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GW-EB-2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-4B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

GW-EB-2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-4B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N) ___ Date Extracted: 03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U UJ,C
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

GW-EB-2

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A2810-4B64

Level: (low/med) LOW Date Received: 03/05/03

% Moisture: _____ decanted: (Y/N)___ Date Extracted:03/06/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 03/07/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I SV-TIC

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW2

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-5

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/06/03

Concentrated Extract Volume: 5000(ul) Date Analyzed: 03/07/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW3

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-6

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/06/03

Concentrated Extract Volume: 2500(ul) Date Analyzed: 03/07/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW4

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-7

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/06/03

Concentrated Extract Volume: 5000(ul) Date Analyzed: 03/07/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW5

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-8

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/06/03

Concentrated Extract Volume: 5000(ul) Date Analyzed: 03/07/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW6

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-2

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/04/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/06/03

Concentrated Extract Volume: 5000(ul) Date Analyzed: 03/07/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW7

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-9

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/06/03

Concentrated Extract Volume: 5000(ul) Date Analyzed: 03/07/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW-DUP-1

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/06/03

Concentrated Extract Volume: 5000(ul) Date Analyzed: 03/07/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW-EB-1

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/04/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:03/06/03

Concentrated Extract Volume: 5000(ul) Date Analyzed: 03/07/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW-EB-2

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) ___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 03/06/03

Concentrated Extract Volume: 5000(ul) Date Analyzed: 03/07/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW2

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-5

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 12000(ul) Date Analyzed: 03/12/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	4.80	U
99-35-4	1,3,5-Trinitrobenzene	3.60	U
121-82-4	RDX	3.60	U
99-65-0	1,3-Dinitrobenzene	3.60	U
118-96-7	2,4,6-Trinitrotoluene	3.60	U
479-45-8	Tetryl	4.80	U
98-95-3	Nitrobenzene	3.60	U
121-14-2	2,4-Dinitrotoluene	3.60	U
606-20-2	2,6-Dinitrotoluene	4.80	U
35572-78-2	2-Amino-4,6-dinitrotoluene	2.0	J
1946-51-0	4-Amino-2,6-dinitrotoluene	2.8	JP JJ
88-72-2	2-Nitrotoluene	3.60	U
99-99-0	4-Nitrotoluene	3.60	U
99-08-1	3-Nitrotoluene	3.60	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW3

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-6

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 12000(ul) Date Analyzed: 03/12/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	4.80	U
99-35-4	1,3,5-Trinitrobenzene	2.2	J
121-82-4	RDX	32	
99-65-0	1,3-Dinitrobenzene	3.60	U
118-96-7	2,4,6-Trinitrotoluene	38	
479-45-8	Tetryl	4.80	U
98-95-3	Nitrobenzene	3.60	U
121-14-2	2,4-Dinitrotoluene	3.60	U
606-20-2	2,6-Dinitrotoluene	4.80	U
35572-78-2	2-Amino-4,6-dinitrotoluene	4.0	J
1946-51-0	4-Amino-2,6-dinitrotoluene	8.6	P J, g
88-72-2	2-Nitrotoluene	3.60	U
99-99-0	4-Nitrotoluene	3.60	U
99-08-1	3-Nitrotoluene	3.60	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW4

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-7

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 18000(ul) Date Analyzed: 03/14/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	7.2	U
99-35-4	1,3,5-Trinitrobenzene	5.4	U
121-82-4	RDX	5.4	U
99-65-0	1,3-Dinitrobenzene	5.4	U
118-96-7	2,4,6-Trinitrotoluene	5.4	U
479-45-8	Tetryl	7.2	U
98-95-3	Nitrobenzene	5.4	U
121-14-2	2,4-Dinitrotoluene	5.4	U
606-20-2	2,6-Dinitrotoluene	7.2	U
35572-78-2	2-Amino-4,6-dinitrotoluene	7.2	U
1946-51-0	4-Amino-2,6-dinitrotoluene	7.2	U
88-72-2	2-Nitrotoluene	5.4	U
99-99-0	4-Nitrotoluene	5.4	U
99-08-1	3-Nitrotoluene	5.4	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW5

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-8

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 14000(ul) Date Analyzed: 03/14/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	3.0	J JM
99-35-4	1,3,5-Trinitrobenzene	4.2	U
121-82-4	RDX	4.2	U
99-65-0	1,3-Dinitrobenzene	4.2	U
118-96-7	2,4,6-Trinitrotoluene	4.2	U
479-45-8	Tetryl	5.6	U
98-95-3	Nitrobenzene	4.2	U
121-14-2	2,4-Dinitrotoluene	4.2	U
606-20-2	2,6-Dinitrotoluene	5.6	U
35572-78-2	2-Amino-4,6-dinitrotoluene	5.6	U
1946-51-0	4-Amino-2,6-dinitrotoluene	5.6	U
88-72-2	2-Nitrotoluene	4.2	U
99-99-0	4-Nitrotoluene	4.2	U
99-08-1	3-Nitrotoluene	4.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW6

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-2

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/04/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/05/03

Concentrated Extract Volume: 14000(ul) Date Analyzed: 03/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	5.6	U
99-35-4	1,3,5-Trinitrobenzene	4.2	U
121-82-4	RDX	4.2	U
99-65-0	1,3-Dinitrobenzene	4.2	U
118-96-7	2,4,6-Trinitrotoluene	4.2	U
479-45-8	Tetryl	5.6	U
98-95-3	Nitrobenzene	4.2	U
121-14-2	2,4-Dinitrotoluene	4.2	U
606-20-2	2,6-Dinitrotoluene	5.6	U
35572-78-2	2-Amino-4,6-dinitrotoluene	5.6	U
1946-51-0	4-Amino-2,6-dinitrotoluene	5.6	U
88-72-2	2-Nitrotoluene	4.2	U
99-99-0	4-Nitrotoluene	4.2	U
99-08-1	3-Nitrotoluene	4.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW7

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-9

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 12000(ul) Date Analyzed: 03/12/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	4.7	JP
99-35-4	1,3,5-Trinitrobenzene	3.60	U
121-82-4	RDX	3.60	U
99-65-0	1,3-Dinitrobenzene	3.60	U
118-96-7	2,4,6-Trinitrotoluene	3.60	U
479-45-8	Tetryl	4.80	U
98-95-3	Nitrobenzene	3.60	U
121-14-2	2,4-Dinitrotoluene	3.60	U
606-20-2	2,6-Dinitrotoluene	4.80	U
35572-78-2	2-Amino-4,6-dinitrotoluene	4.80	U
1946-51-0	4-Amino-2,6-dinitrotoluene	4.80	U
88-72-2	2-Nitrotoluene	3.60	U
99-99-0	4-Nitrotoluene	3.60	U
99-08-1	3-Nitrotoluene	3.60	U

JP JJ

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW-DUP-1

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-3

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 16000(ul) Date Analyzed: 03/12/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	6.40	U
99-35-4	1,3,5-Trinitrobenzene	4.80	U
121-82-4	RDX	4.80	U
99-65-0	1,3-Dinitrobenzene	4.80	U
118-96-7	2,4,6-Trinitrotoluene	4.80	U
479-45-8	Tetryl	6.40	U
98-95-3	Nitrobenzene	4.80	U
121-14-2	2,4-Dinitrotoluene	4.80	U
606-20-2	2,6-Dinitrotoluene	6.40	U
35572-78-2	2-Amino-4,6-dinitrotoluene	6.40	U
1946-51-0	4-Amino-2,6-dinitrotoluene	6.40	U
88-72-2	2-Nitrotoluene	4.80	U
99-99-0	4-Nitrotoluene	4.80	U
99-08-1	3-Nitrotoluene	4.80	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW-EB-1

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-1

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/04/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/05/03

Concentrated Extract Volume: 14000(ul) Date Analyzed: 03/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	5.6	U
99-35-4	1,3,5-Trinitrobenzene	4.2	U
121-82-4	RDX	4.2	U
99-65-0	1,3-Dinitrobenzene	4.2	U
118-96-7	2,4,6-Trinitrotoluene	4.2	U
479-45-8	Tetryl	5.6	U
98-95-3	Nitrobenzene	4.2	U
121-14-2	2,4-Dinitrotoluene	4.2	U
606-20-2	2,6-Dinitrotoluene	5.6	U
35572-78-2	2-Amino-4,6-dinitrotoluene	5.6	U
1946-51-0	4-Amino-2,6-dinitrotoluene	5.6	U
88-72-2	2-Nitrotoluene	4.2	U
99-99-0	4-Nitrotoluene	4.2	U
99-08-1	3-Nitrotoluene	4.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW-EB-2

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-4

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 16000(ul) Date Analyzed: 03/12/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	6.40	U
99-35-4	1,3,5-Trinitrobenzene	4.80	U
121-82-4	RDX	4.80	U
99-65-0	1,3-Dinitrobenzene	4.80	U
118-96-7	2,4,6-Trinitrotoluene	4.80	U
479-45-8	Tetryl	6.40	U
98-95-3	Nitrobenzene	4.80	U
121-14-2	2,4-Dinitrotoluene	4.80	U
606-20-2	2,6-Dinitrotoluene	6.40	U
35572-78-2	2-Amino-4,6-dinitrotoluene	6.40	U
1946-51-0	4-Amino-2,6-dinitrotoluene	6.40	U
88-72-2	2-Nitrotoluene	4.80	U
99-99-0	4-Nitrotoluene	4.80	U
99-08-1	3-Nitrotoluene	4.80	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW2

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-5

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 12000(ul) Date Analyzed: 03/11/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	72	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW3

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-6

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 12000(ul) Date Analyzed: 03/11/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	72	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW4

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-7

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 18000(ul) Date Analyzed: 03/11/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	110	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW5

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-8

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 14000(ul) Date Analyzed: 03/11/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	84	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW6

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-2

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/04/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/05/03

Concentrated Extract Volume: 14000(ul) Date Analyzed: 03/08/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	84	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54MW7

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-9

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 12000(ul) Date Analyzed: 03/11/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	72	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW-DUP-1

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-3

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 16000(ul) Date Analyzed: 03/11/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	96	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW-EB-1

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-1

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/04/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/05/03

Concentrated Extract Volume: 14000(ul) Date Analyzed: 03/08/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	84	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GW-EB-2

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix: (soil/water) WATER Lab Sample ID: A2810-4

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 03/05/03

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:03/11/03

Concentrated Extract Volume: 16000(ul) Date Analyzed: 03/11/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	96	U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54MW2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix (soil/water): WATER Lab Sample ID: A2810-5

Level (low/med): LOW Date Received: 3/5/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	59.0	B		P	
7440-36-0	Antimony	1.8	U		P	
7440-38-2	Arsenic	3.6	U		P	
7440-39-3	Barium	137			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	49300			P	
7440-47-3	Chromium	3.0	B		P	
7440-48-4	Cobalt	0.90	U		P	
7440-50-8	Copper	1.2	U		P	
7439-89-6	Iron	51.9	B		P	B,O
7439-92-1	Lead	1.3	U		P	UL,W
7439-95-4	Magnesium	21100			P	
7439-96-5	Manganese	7.9	B		P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	2.7	B		P	
7440-09-7	Potassium	439	B		P	L,W
7782-49-2	Selenium	2.1	U	N	P	
7440-22-4	Silver	0.80	U		P	
7440-23-5	Sodium	4560			P	
7440-28-0	Thallium	3.8	U	N	P	UL,W
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	18.0	B		P	L,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54MW3

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix (soil/water): WATER Lab Sample ID: A2810-6

Level (low/med): LOW Date Received: 3/5/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	29.5	U		P	
7440-36-0	Antimony	1.8	U		P	
7440-38-2	Arsenic	3.6	U		P	
7440-39-3	Barium	184			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	79300			P	
7440-47-3	Chromium	2.9	B		P	
7440-48-4	Cobalt	0.90	U		P	
7440-50-8	Copper	1.2	U		P	
7439-89-6	Iron	17.6	B		P	B,O
7439-92-1	Lead	1.3	U		P	UL,W
7439-95-4	Magnesium	29900			P	
7439-96-5	Manganese	0.67	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.7	B		P	
7440-09-7	Potassium	1180			P	L,W
7782-49-2	Selenium	5.1		N	P	B,P
7440-22-4	Silver	0.80	U		P	
7440-23-5	Sodium	16600			P	
7440-28-0	Thallium	3.8	U	N	P	UL,W
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	27.6			P	L,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54MW4

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix (soil/water): WATER Lab Sample ID: A2810-7

Level (low/med): LOW Date Received: 3/5/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	29.5	U		P	
7440-36-0	Antimony	1.8	U		P	
7440-38-2	Arsenic	3.6	U		P	
7440-39-3	Barium	16.3			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	113000			P	
7440-47-3	Chromium	1.0	B		P	
7440-48-4	Cobalt	0.90	U		P	
7440-50-8	Copper	1.2	U		P	
7439-89-6	Iron	128			P	
7439-92-1	Lead	1.3	U		P	UL,W
7439-95-4	Magnesium	51800			P	
7439-96-5	Manganese	1.1	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.2	U		P	
7440-09-7	Potassium	1730			P	L,W
7782-49-2	Selenium	3.0	B	N	P	B,P
7440-22-4	Silver	0.80	U		P	
7440-23-5	Sodium	4290			P	
7440-28-0	Thallium	3.8	U	N	P	UL,W
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	7.3	B		P	L,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54MW5

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix (soil/water): WATER Lab Sample ID: A2810-8

Level (low/med): LOW Date Received: 3/5/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	221			P	
7440-36-0	Antimony	1.8	U		P	
7440-38-2	Arsenic	3.6	U		P	
7440-39-3	Barium	149			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	88300			P	
7440-47-3	Chromium	5.2			P	
7440-48-4	Cobalt	2.5	B		P	
7440-50-8	Copper	1.2	U		P	
7439-89-6	Iron	267			P	
7439-92-1	Lead	1.3	U		P	UL,W
7439-95-4	Magnesium	27500			P	
7439-96-5	Manganese	157			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	5.9			P	
7440-09-7	Potassium	1310			P	L,W
7782-49-2	Selenium	2.1	U	N	P	
7440-22-4	Silver	0.80	U		P	
7440-23-5	Sodium	6820			P	
7440-28-0	Thallium	3.8	U	N	P	UL,W
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	4.1	B		P	L,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54MW6

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix (soil/water): WATER Lab Sample ID: A2810-2

Level (low/med): LOW Date Received: 3/4/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	145			P	B,L
7440-36-0	Antimony	1.8	U		P	
7440-38-2	Arsenic	3.6	U		P	
7440-39-3	Barium	74.4			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	28000			P	
7440-47-3	Chromium	3.5	B		P	B,L
7440-48-4	Cobalt	0.90	U		P	
7440-50-8	Copper	1.5	B		P	
7439-89-6	Iron	951			P	
7439-92-1	Lead	1.3	U		P	UL,W
7439-95-4	Magnesium	13600			P	
7439-96-5	Manganese	27.0			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	3.2	B		P	
7440-09-7	Potassium	1180			P	L,W
7782-49-2	Selenium	4.4	B	N	P	B,P
7440-22-4	Silver	0.80	U		P	
7440-23-5	Sodium	2830			P	
7440-28-0	Thallium	3.8	U	N	P	UL,W
7440-62-2	Vanadium	0.72	B		P	
7440-66-6	Zinc	0.60	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54MW7

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix (soil/water): WATER Lab Sample ID: A2810-9

Level (low/med): LOW Date Received: 3/5/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	295			P	
7440-36-0	Antimony	1.8	U		P	
7440-38-2	Arsenic	3.6	U		P	
7440-39-3	Barium	70.4			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	45700			P	
7440-47-3	Chromium	7.1			P	
7440-48-4	Cobalt	0.90	U		P	
7440-50-8	Copper	1.4	B		P	
7439-89-6	Iron	381			P	
7439-92-1	Lead	1.3	U		P	UL1W
7439-95-4	Magnesium	14800			P	
7439-96-5	Manganese	110			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	5.7			P	
7440-09-7	Potassium	426	B		P	L1W
7782-49-2	Selenium	2.6	B	N	P	B1P
7440-22-4	Silver	0.80	U		P	
7440-23-5	Sodium	8480			P	
7440-28-0	Thallium	3.8	U	N	P	UL1W
7440-62-2	Vanadium	1.2	B		P	
7440-66-6	Zinc	3.7	B		P	L1W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW-DUP-1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix (soil/water): WATER Lab Sample ID: A2810-3

Level (low/med): LOW Date Received: 3/5/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	150			P	
7440-36-0	Antimony	1.8	U		P	
7440-38-2	Arsenic	3.6	U		P	
7440-39-3	Barium	57.1			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	39400			P	
7440-47-3	Chromium	3.7	B		P	
7440-48-4	Cobalt	0.90	U		P	
7440-50-8	Copper	1.2	U		P	
7439-89-6	Iron	163			P	
7439-92-1	Lead	1.3	U		P	UL,W
7439-95-4	Magnesium	12300			P	
7439-96-5	Manganese	79.3			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	3.6	B		P	
7440-09-7	Potassium	357	B		P	L,W
7782-49-2	Selenium	3.1	B	N	P	B,P
7440-22-4	Silver	0.80	U		P	
7440-23-5	Sodium	8700			P	
7440-28-0	Thallium	3.8	U	N	P	UL,W
7440-62-2	Vanadium	0.78	B		P	
7440-66-6	Zinc	1.4	B		P	L,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
GW-EB-1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix (soil/water): WATER Lab Sample ID: A2810-1

Level (low/med): LOW Date Received: 3/4/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	37.6	B		P	
7440-36-0	Antimony	1.8	U		P	
7440-38-2	Arsenic	3.6	U		P	
7440-39-3	Barium	0.33	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	26.2	U		P	
7440-47-3	Chromium	3.5	B		P	
7440-48-4	Cobalt	5.0			P	
7440-50-8	Copper	1.2	U		P	
7439-89-6	Iron	34.4	B		P	B,O
7439-92-1	Lead	1.3	U		P	UL,W
7439-95-4	Magnesium	12.8	B		P	B,O
7439-96-5	Manganese	0.93	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.2	U		P	
7440-09-7	Potassium	30.6	U		P	UL,W
7782-49-2	Selenium	2.4	B	N	P	B,P
7440-22-4	Silver	0.80	U		P	
7440-23-5	Sodium	529	B		P	L,O
7440-28-0	Thallium	3.8	U	N	P	UL,W
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	0.60	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

16

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
GW-EB-2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: A2810

Matrix (soil/water): WATER Lab Sample ID: A2810-4

Level (low/med): LOW Date Received: 3/5/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	29.5	U		P	
7440-36-0	Antimony	1.8	U		P	
7440-38-2	Arsenic	3.6	U		P	
7440-39-3	Barium	0.20	U		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.30	U		P	
7440-70-2	Calcium	26.2	U		P	
7440-47-3	Chromium	0.70	U		P	
7440-48-4	Cobalt	0.90	U		P	
7440-50-8	Copper	1.2	U		P	
7439-89-6	Iron	15.0	U		P	
7439-92-1	Lead	1.3	U		P	UL,W
7439-95-4	Magnesium	7.4	U		P	
7439-96-5	Manganese	0.43	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.2	U		P	
7440-09-7	Potassium	30.6	U		P	UL,W
7782-49-2	Selenium	5.2		N	P	B,P
7440-22-4	Silver	0.80	U		P	
7440-23-5	Sodium	386	B		P	L,O
7440-28-0	Thallium	3.8	U	N	P	UL,W
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	0.60	U		P	UL,W

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

17

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 4/15/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: A2810
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?			✓
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

collected	extract	analyzed
3/4/03	3/6/03	3/7/03
3/3/03	7	7

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes:

see attached

UJ,C

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓
	1 or more <10% / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high Positives: L / J / L / K Non-detects: R / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 54MW7 ND GW-DUP-1 ND

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			✓

Notes:

Pos TIC → NJ, t

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RA
Date: 4/15/03
DV Level: II (III) IV
Review Document:

_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: A2810
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

collected	extract	analyzed
3/4/02	3/6/02	3/7/03
3/3/02	4	4

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			✓
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			✓
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: fluoranthrene 22 %. 720%.

Parent 54MW5 UDJ no flag

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes:

54MW7 ND GW-DUP-1 ND

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		✓	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness = 100 %			

Notes:

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 4/15/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: A2810
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

collected	extract	analyzed
3/4/03	3/11/03	3/12/03
3/3/03	3/5/03	3/6/03

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			✓
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			✓
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: See attached
no pos
no flag

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			(
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: HMX MSD 45% C lower QC
in parent 54MW5 →J,m

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 54MW7 GW-DUP-1
HMX 4.7 6.4 U OK✓

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes: several 740's → J/g

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:			
10.1.3	Number of results rejected and not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			
	% Completeness =			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: RA
Date: 4/15/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: A2810
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

Collected	Extract	Analyzed
3/14/03	3/11/03	3/11/03
3/31/03	3/5/03	3/5/03

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes:

4.0 Initial and Continuing Calibration		**Yes**	**No**	**NA**
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			✓
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			✓
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes:

5.0 Surrogate Recovery		**Yes**	**No**	**NA**
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			/
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			/
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		**Yes**	**No**	**NA**
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			✓
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: GMW7 ND GW-DUP-1 ND

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		✓	

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		**Yes**	**No**	**NA**
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: A2810
Project No.: 15291524.00000

Project Name: Radford SWMU 54
Reviewer: RA
Date: 4/15/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes, % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: collected 3/3/4/03 analyzed 3/11/03

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%?		✓				
	<50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						

Note:

Cadmium 113.2 ND no flag
lead 82.3 UL,W
Potassium 65.4 L,W UL,W
Selenium 118 ~~J~~ prev B,P
Thallium 71.1 UL
Zinc 72.1 L,W UL,W

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note: _____

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.	✓			✓		

Note: _____

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓		
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L						
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.			✓			✓

Note: Se 125.7/125.9 Pos prev → B,P no more action
Tl 59.9/63.1 prev UL, W

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).	✓					

Note:

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		✓		✓		

Note: see attached

manganese. 32%. Comment

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?			✓			✓
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note:

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples:_____						
13.1.2	Number of target compounds in each analysis:_____						
13.1.3	Number of results rejected and not reported:_____						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%.						

Note:

GW-EB-1
Al 37.6
Ba .33
Cr 3.5
Co 3
Na 529
pos <5x B, x

GW-EB-2
Na 386

ICB -44.27
Fe 18 B,U
lead -1.6 prep
Mg 7.97
B,P Mn .37 -289.4
Li Sodium
Zinc -4.3 prev

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L						
4.5	Are there reported field blankor trip blank values > ± MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						

Note: MB → Calcium -50.038 ug/L >
Se 3.41 B,P
Zinc -3.273 → <5x → prev. L,W

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1060

Project Number	Project Name
69604-3ND	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Copen

LAB: 5

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
GW/EB-1	3/3/05 1530	5		X	2	E	F/U	8		X	X			X		X							Dissolved Metals as well

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other ____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/3/05 1700				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 3-3-05 9.40	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1058 (5)

Project Number	Project Name
07604.310	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Brett Fisher / Cooper

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW6	3/3/05 1505	5		X	2	E	F/U	8		X	X			X		X							Total Dissolved metals is also included. No high concentrations are expected.

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	3/3/05 1810				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time 3-4-05 9:40	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1046

Project Number	Project Name
07604.310	RFAAP

Project Contact (Name and Phone Number): Todd Lamaska

Samplers: Fisher / Cooper

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
GW/Dup-1	3/4/03 [redacted]	5		X	2	F	F	8		X	X			X		X							Dissolved metals as well. High concentrations expected.

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/03 1800				
Relinquished by:	Date/time	Received by (for lab): [signature]	Date/Time: 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1044

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Todd LaMarkin

Samplers: Fisher / Copen

LAB: CO

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
GW1/ER-2	3/4/03 1530	5		X	2	E/B	F/L	8		X	X			X		X							Dissolved metals
																							to be run
																							[redacted]

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/03 1600				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 3/5/03 9:20	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1052

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Coker

LAB: 64

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
SWMW2-	3/4/03 1510	5		X	2	GB	FL	8		X	X			X		X							Dissolved metals only high concentration

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 Ice
I. ZnAc + NOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/03 1910				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1051

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Copen

LAB: CO

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW3	3/4/03 1355	5		X	2	6	F	8		X	X			X		X							Dissolved Metals as well

Box #1			Box #2			Box #3	Box #4	
1. Surface Water	6. Trip Blank		A. HCl + Ice	F. Ice Only		F. Filtered	R. Rush - 3 Day	
2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other _____		U. Unfiltered	S. Standard 28 Day	
3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice			T. Timely 14 Day	
4. Rinsate	9. Other _____		D. H2SO4 + Ice	I. ZnAc + NaOH + Ice			O. Other _____	
5. Soil Sediment/Sludge			E. Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/03 1900				
Relinquished by:	Date/time	Received by: (for lab) Marcus Bailey	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 20°C

Radford Army Ammunition Plant

Chain Of Custody Record

Nº 1050

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Copen

LAB: G

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
SYMW4	3/4/03 1230	S		X	2	F&P	F	8		X	X			X		X							Total + Dissolved metals
																							High concentration expected

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/03 1700				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

No 1054

Project Number	Project Name
2604310	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Copen

LAB: 7

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
SWMW5	3/4/05 850	5		X	2	F	F/U	8		X	X			X		X							Metals is dissolved and undissolved total. High concentrations expected.

Box #1			Box #2			Box #3		Box #4	
1.	Surface Water	6. Trip Blank	A.	HCl + Ice	F. Ice Only	F.	Filtered	R.	Rush - 3 Day
2.	Ground Water	7. Oil	B.	HNO3 + Ice	G. Other _____	U.	Unfiltered	S.	Standard 28 Day
3.	Leachate	8. Waste	C.	NaOH + Ice	H. NaHSO4 + Ice			T.	Timely 14 Day
4.	Rinsate	9. Other _____	D.	H2SO4 + Ice	I. ZnAc + NaOH + Ice			O.	Other _____
5.	Soil Sediment/Sludge		E.	Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett L. Fisher	3/4/05 1800				
Relinquished by:	Date/time	Received by: (for lab) Sharon F. Bailey	Date/Time 3/5/05 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1055

Project Number	Project Name
07604310	RFAAP

Project Contact (Name and Phone Number): Todd LaMarkin

Samplers: Brad Fisher / Dave Coyen

LAB: 7

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW3 MS	3/4/03 850	5		X	2	G	F	8		X	X			X		X							Metals is Dissolved and undissolved
																							High concentrations are expected.

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brad Fisher	3/4/03 1800				
Relinquished by:	Date/time	Received by: (for lab) Maxine Baity	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp: 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

No 1056

Project Number	Project Name
09604 310	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher/Copen

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW5MSD	3/4/03 1550	5		X	2	E6	F/L	8		X	X			X		X							Metals is dissolved and unfiltered
																							high concentrations are expected.

Box #1			Box #2			Box #3	Box #4	
1. Surface Water	6. Trip Blank		A. HCl + Ice	F. Ice Only		F. Filtered	R. Rush - 3 Day	
2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other _____		U. Unfiltered	S. Standard 28 Day	
3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice			T. Timely 14 Day	
4. Rinsate	9. Other _____		D. H2SO4 + Ice	I. ZnAc + NaOH + Ice			O. Other _____	
5. Soil Sediment/Sludge			E. Unpreserved					

Relinquished by	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Fisher	3/4/03 1800				
Relinquished by:	Date/time	Received by: (for lab) Laurence Bailey	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 20°C

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1057

Project Number	Project Name
09604-510	RFRAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Copen

LAB: 7

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW7	3/4/03 1030	5		X	2	~~F~~	F/h	8		X	X			X		X							Dissolved Metals as well. High concentrations expected.

Box #1			Box #2			Box #3		Box #4	
1.	Surface Water	6. Trip Blank	A.	HCl + Ice	F. Ice Only	F.	Filtered	R.	Rush - 3 Day
2.	Ground Water	7. Oil	B.	HNO3 + Ice	G. Other _____	U.	Unfiltered	S.	Standard 28 Day
3.	Leachate	8. Waste	C.	NaOH + Ice	H. NaHSO4 + Ice			T.	Timely 14 Day
4.	Rinsate	9. Other _____	D.	H2SO4 + Ice	I. ZnAc + NaOH + Ice			O.	Other _____
5.	Soil Sediment/Sludge		E.	Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett [illegible]	3/4/03 1800				
Relinquished by:	Date/time	Received by: (for lab) Jacque Bailey	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: B2810 **Fraction:** Metals

Lab: CompuChem **Project Name:** Radford SWMU 54

Reviewer: AS **Date:** April 2, 2003

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: For the metal analyses, the initial and continuing calibration blanks contained positive detections for antimony, barium, beryllium, cadmium, calcium, cobalt, magnesium, manganese, potassium, selenium, silver, and vanadium. All associated sample results less than five times the blank concentration were flagged "B,o". The initial calibration blank also displayed a negative detection for cobalt. Associated non-detect sample results were flagged "UL,o". All associated positive detections were less than five times the absolute value of the initial calibration blank concentration and were flagged "L,o", unless otherwise qualified due to field blank contamination.

The batch blank displayed a positive detection for zinc at 1.488 ug/L and a negative detection for iron at -8.852 ug/L. Associated positive results less than five times the batch blank concentration for zinc were flagged "B,p". All associated results for iron were non-detect and were flagged "UL,p". The batch blank also contained positive results for barium, magnesium, potassium, and selenium and negative results for cobalt and iron. These results were previously flagged due to calibration blank contamination and no further data qualifying action was required.

Equipment blank GW-EB-1 collected on 3/3/03 displayed a detection for nickel at 1.9 ug/L. Equipment blank GW-EB-2 collected on 3/4/03 displayed a detection for cobalt at 0.62 ug/L. Positive results less than 5 times the blank concentration were flagged "B,x" in the associated samples.

The initial CRDL percent recoveries for aluminum (160.7%), antimony, (116.1%), arsenic (79.5%), cadmium (111.2%), cobalt (86.6%), copper (58.2%), lead (119.7%), nickel (117.4%), potassium (114.5%), selenium (148.0%), sodium

(78.0%), and thallium (62.6%) were outside the control limit (i.e., 90-110%). Positive associated field sample results less than 2xCRDL were flagged "K,w" for aluminum, lead, nickel, potassium, and selenium, unless previously flagged due to blank contamination. The associated sample results were non-detect for antimony and cadmium while the CRDL displayed a positive bias, thus, no data qualifying action was taken. The associated non-detect sample results for arsenic, cobalt, copper, sodium, and thallium were flagged "UL,w" and positive detections less than 2xCRDL were flagged "L,w", unless previously flagged as blank contamination or biased low due to negative detections in the initial calibration blank.

The MS/MSD pair for sample 54MW5 displayed recoveries for arsenic (73.1%/73.2%) that were less than the lower QC limit. All associated sample results were non-detect and were previously flagged "UL,w" due to low recovery in the CRDL standard. No further data qualifying action was taken.

The percent difference for the serial dilution analysis on sample 54MW5 was greater than the QC limit (i.e., 10%) for sodium at 14.2%. Positive results were flagged "J,s", unless previously flagged due to low recovery in the CRDL standard.

Correctable Anomalies: None.

Comments: All data as qualified, are usable for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

SW-846 METALS

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: B2810

SOW No.: SW-846

EPA Sample No.	Lab Sample ID.
54MW2	B2810-5
54MW3	B2810-6
54MW4	B2810-7
54MW5	B2810-8
54MW5D	WG23056-3
54MW5S	WG23056-1
54MW5SD	WG23056-2
54MW6	B2810-2
54MW7	B2810-9
GW-DUP-1	B2810-3
GW-EB-1	B2810-1
GW-EB-2	B2810-4

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: THE FOLLOWING ANALYTES HAVE BEEN FLAGGED WITH AN "E" TO INDICATE SERIAL DILUTION RESULTS WHICH ARE NOT WITHIN CONTROL LIMITS:
SODIUM

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Thomas R. Cole Name: Thomas R. Cole

Date: March 11, 2003 Title: Data Reviewer II

SW-846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54MW2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: B2810

Matrix (soil/water): WATER Lab Sample ID: B2810-5

Level (low/med): LOW Date Received: 03/05/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11.8	U		P	
7440-36-0	Antimony	2.3	U		P	
7440-38-2	Arsenic	3.7	U	N	P	UL,w
7440-39-3	Barium	139			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	51800			P	
7440-47-3	Chromium	1.1	B		P	
7440-48-4	Cobalt	0.50	U		P	UL,o
7440-50-8	Copper	1.5	U		P	UL,w
7439-89-6	Iron	8.7	U		P	UL,p
7439-92-1	Lead	1.1	U		P	
7439-95-4	Magnesium	20700			P	
7439-96-5	Manganese	2.6	B		P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	2.8	B		P	B,x
7440-09-7	Potassium	805	B		P	K,w
7782-49-2	Selenium	6.1			P	B,o
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	3140		E	P	L,w
7440-28-0	Thallium	4.4	U		P	UL,w
7440-62-2	Vanadium	0.40	U		P	
7440-66-6	Zinc	21.1			P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW-846 METALS

-I-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54MW3

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: B2810

Matrix (soil/water): WATER Lab Sample ID: B2810-6

Level (low/med): LOW Date Received: 03/05/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11.8	U		P	
7440-36-0	Antimony	2.3	U		P	
7440-38-2	Arsenic	3.7	U	N	P	UL, w
7440-39-3	Barium	190			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	82700			P	
7440-47-3	Chromium	1.6	B		P	
7440-48-4	Cobalt	0.50	U		P	UL, o
7440-50-8	Copper	1.5	U		P	UL, w
7439-89-6	Iron	8.7	U		P	UL, P
7439-92-1	Lead	1.1	U		P	
7439-95-4	Magnesium	29800			P	
7439-96-5	Manganese	0.29	B		P	B, o
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	2.1	B		P	B, x
7440-09-7	Potassium	2080			P	
7782-49-2	Selenium	7.4			P	B, o
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	14900		E	P	J, S
7440-28-0	Thallium	4.4	U		P	UL, w
7440-62-2	Vanadium	0.40	U		P	
7440-66-6	Zinc	28.9			P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW-846 METALS

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54MW4

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: B2810

Matrix (soil/water): WATER Lab Sample ID: B2810-7

Level (low/med): LOW Date Received: 03/05/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11.8	U		P	
7440-36-0	Antimony	2.3	U		P	
7440-38-2	Arsenic	3.7	U	N	P	UL,W
7440-39-3	Barium	15.8			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	112000			P	
7440-47-3	Chromium	0.60	U		P	
7440-48-4	Cobalt	0.50	U		P	UL,O
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	8.7	U		P	UL,P
7439-92-1	Lead	1.1	U		P	
7439-95-4	Magnesium	50000			P	
7439-96-5	Manganese	0.87	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.8	B		P	B,X
7440-09-7	Potassium	2840			P	
7782-49-2	Selenium	3.8	B		P	B,O
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	2760		E	P	L,W
7440-28-0	Thallium	4.4	U		P	UL,W
7440-62-2	Vanadium	0.40	U		P	
7440-66-6	Zinc	7.0	B		P	B,P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54MW5

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: B2810

Matrix (soil/water): WATER Lab Sample ID: B2810-8

Level (low/med): LOW Date Received: 03/05/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11.8	U		P	
7440-36-0	Antimony	2.3	U		P	
7440-38-2	Arsenic	3.7	U	N	P	UL,W
7440-39-3	Barium	146			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	90900			P	
7440-47-3	Chromium	0.60	B		P	
7440-48-4	Cobalt	2.4	B		P	B,X
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	8.7	U		P	UL,P
7439-92-1	Lead	1.1	U		P	
7439-95-4	Magnesium	27300			P	
7439-96-5	Manganese	160			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	4.4	B		P	B,X
7440-09-7	Potassium	2210			P	
7782-49-2	Selenium	5.0			P	K,W
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	5310		E	P	J,S
7440-28-0	Thallium	4.4	U		P	UL,W
7440-62-2	Vanadium	0.46	B		P	B,O
7440-66-6	Zinc	4.0	B		P	B,P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW-846 METALS

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54MW6

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: B2810

Matrix (soil/water): WATER Lab Sample ID: B2810-2

Level (low/med): LOW Date Received: 03/04/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11.8	U		P	
7440-36-0	Antimony	2.3	U		P	
7440-38-2	Arsenic	3.7	U	N	P	UL,w
7440-39-3	Barium	70.5			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	27500			P	
7440-47-3	Chromium	1.6	B		P	
7440-48-4	Cobalt	0.50	U		P	UL,o
7440-50-8	Copper	1.5	U		P	UL,w
7439-89-6	Iron	8.7	U		P	UL,p
7439-92-1	Lead	1.6	B		P	K,w
7439-95-4	Magnesium	12100			P	
7439-96-5	Manganese	6.8	B		P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	2.4	B		P	B,x
7440-09-7	Potassium	1990			P	K,w
7782-49-2	Selenium	2.6	U		P	
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	1730	B	E	P	L,w
7440-28-0	Thallium	4.4	U		P	UL,w
7440-62-2	Vanadium	0.49	B		P	
7440-66-6	Zinc	3.4	B		P	B,p

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.: 54MW7

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: B2810

Matrix (soil/water): WATER Lab Sample ID: B2810-9

Level (low/med): LOW Date Received: 03/05/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15.8	B		P	K,W
7440-36-0	Antimony	2.3	U		P	
7440-38-2	Arsenic	3.7	U	N	P	UL,W
7440-39-3	Barium	55.3			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	40300			P	
7440-47-3	Chromium	0.98	B		P	
7440-48-4	Cobalt	0.50	U		P	UL,O
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	8.7	U		P	UL,P
7439-92-1	Lead	1.1	U		P	
7439-95-4	Magnesium	11600			P	
7439-96-5	Manganese	71.2			P	
7439-97-6	Mercury	0.13	B		CV	
7440-02-0	Nickel	2.4	B		P	B,X
7440-09-7	Potassium	627	B		P	B,O
7782-49-2	Selenium	4.0	B		P	B,O
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	7100		E	P	J,S
7440-28-0	Thallium	4.4	U		P	UL,W
7440-62-2	Vanadium	0.48	B		P	
7440-66-6	Zinc	9.2	B		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW-846 METALS

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW-DUP-1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: B2810

Matrix (soil/water): WATER Lab Sample ID: B2810-3

Level (low/med): LOW Date Received: 03/05/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14.7	B		P	K,W
7440-36-0	Antimony	2.3	U		P	
7440-38-2	Arsenic	3.7	U	N	P	UL,W
7440-39-3	Barium	55.4			P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	40300			P	
7440-47-3	Chromium	0.67	B		P	
7440-48-4	Cobalt	0.50	U		P	UL,S
7440-50-8	Copper	1.5	U		P	UL,W
7439-89-6	Iron	8.7	U		P	UL,P
7439-92-1	Lead	1.2	B		P	K,W
7439-95-4	Magnesium	11700			P	
7439-96-5	Manganese	72.9			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.8	B		P	B,X
7440-09-7	Potassium	617	B		P	B,S
7782-49-2	Selenium	4.3	B		P	B,S
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	7190		E	P	J,S
7440-28-0	Thallium	4.4	U		P	UL,W
7440-62-2	Vanadium	0.77	B		P	
7440-66-6	Zinc	11.6	B		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW-846 METALS

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW-EB-1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: B2810

Matrix (soil/water): WATER Lab Sample ID: B2810-1

Level (low/med): LOW Date Received: 03/04/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11.8	U		P	
7440-36-0	Antimony	2.3	U		P	
7440-38-2	Arsenic	3.7	U	N	P	UL,w
7440-39-3	Barium	0.46	B		P	B,o
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	42.3	B		P	B,o
7440-47-3	Chromium	0.60	U		P	
7440-48-4	Cobalt	0.77	B		P	L,o
7440-50-8	Copper	1.5	U		P	UL,w
7439-89-6	Iron	8.7	U		P	UL,P
7439-92-1	Lead	1.1	U		P	
7439-95-4	Magnesium	76.7	B		P	B,o
7439-96-5	Manganese	0.49	B		P	B,o
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.9	B		P	K,w
7440-09-7	Potassium	68.4	U		P	
7782-49-2	Selenium	2.6	U		P	
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	99.3	U	E	P	
7440-28-0	Thallium	4.4	U		P	UL,w
7440-62-2	Vanadium	0.40	U		P	
7440-66-6	Zinc	1.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

GW-EB-2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: B2810

Matrix (soil/water): WATER Lab Sample ID: B2810-4

Level (low/med): LOW Date Received: 03/05/03

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11.8	U		P	
7440-36-0	Antimony	2.3	U		P	
7440-38-2	Arsenic	3.7	U	N	P	VL,W
7440-39-3	Barium	0.42	B		P	B,P
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	54.9	B		P	B,C
7440-47-3	Chromium	0.60	U		P	
7440-48-4	Cobalt	0.62	B		P	L,C
7440-50-8	Copper	1.5	U		P	VL,W
7439-89-6	Iron	8.7	U		P	VL,P
7439-92-1	Lead	1.1	U		P	
7439-95-4	Magnesium	73.8	B		P	B,C
7439-96-5	Manganese	0.65	B		P	B,C
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	97.0	B		P	B,C
7782-49-2	Selenium	2.6	U		P	
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	99.3	U	E	P	
7440-28-0	Thallium	4.4	U		P	VL,W
7440-62-2	Vanadium	0.40	U		P	
7440-66-6	Zinc	1.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

Project Name: Radford SWMU 54
SDG No.: B2810
Reviewer: AS
Project No.: 15291524.00000
Date: 4/2/2003

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note: Both coolers @ 2°C
Fld filtered and preserved

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: Sampled 3/3-4/03
digested 3/10/03 3/10/03 HG
analyzed 3/8/03 - ICP 3/11/03 HG

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R". #s -5 pts/Blk r 0.999992				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%? Hg 115%		✓				
	2xCRDL>[sample]>IDL <50% L(+)/R(-) 50%-89% L(+)/UL(-) >110% K						

Note: CRDL

aluminum	160.7	K (2W)
antimony	116.1	K
arsenic	79.5	L/UL
cadmium	111.2	K
cobalt	86.6	L/UL
Copper	58.2	L/UL
lead	119.7	K
nickel	117.4	K
potassium	114.5	K
Selenium	148.0	K
Sodium	78.0	L/UL
thallium	62.6%	L/UL

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?		✓			✓	
	Sample Results > MDL						
	< 5X Blank Contamination B		✓				
4.4	Are there negative blank results with the absolute value > MDL?		✓			✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L		✓				
4.5	Are there reported field blankor trip blank values > ± MDL?		✓			✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						

Soil copies

Note: GW-EB-1 Barium 0.46 µg/L; Calcium 42.3; Cobalt 0.77; Mg 76.7; Mn 0.49; Ni 1.9

GW-EB-2 Barium 0.42 µg/L; Ca 54.9; Co 0.62; Mg 73.8; Mn 0.65; ~~Fe~~ K 97.0

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning ~~and end~~ of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?		✓				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓					
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	✓			✓		

Note: 54MW5 "D"

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓		
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L				✓		
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is			✓			✓

Note: 54 MW5 MS / MSD
arsenic 73.1 / 73.2

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note: 54 MW5 "L"
sodium J, +

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report	✓			✓		

Note: 54MW7 / DUP

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓		
12.2	Were all dilution reflected in the positive results and detection limits?			✓			✓

Note:

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples:						
13.1.2	Number of target compounds in each analysis:						
13.1.3	Number of results rejected and not reported:						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)						
	% Completeness = 100 %						

Note:

CompuChem
a Division of Liberty Analytical Corp.
501 Madison Avenue Cary, NC 27513

INORGANIC CASE SUMMARY NARRATIVE
SDG # B2810
PROTOCOL #SW-846

The indicated Sample Delivery Group (SDG) consisting of nine (9) dissolved water samples was received into the laboratory management system (LIMS) on March 4 and 5, 2003 intact and in good condition with Chains of Custody (COC) records in order. Sample ID's reported in this data package are noted by the receiving department on the COC if they differ from those listed by the samplers on the COC.

The samples were analyzed for dissolved TAL metals using analytical methods delineated in SW-846 (Third Edition)-Update III.

SAMPLE IDs:

Customer IDs and correlating laboratory IDs are listed on the cover page.

INSTRUMENTAL QUALITY CONTROL:

All calibration verification solutions (ICV & CCV), blanks (ICB, & CCB), and interference check samples (ICSA & ICSAB) associated with this data were confirmed to be within SW-846 allowable limits.

DISSOLVED SAMPLE QUALITY CONTROL:

The sample quality control verifications (LCSW & PBW) were found to be within acceptable ranges and all dissolved samples were analyzed within the contract specified holding times.

SAMPLE PREPARATION QUALITY CONTROL:

The mercury, sample preparation procedure verifications (LCSW & PBW) were found to be within acceptable ranges and all field samples were prepared and analyzed within the contract specified holding times.

MATRIX RELATED QUALITY CONTROL:

The sample matrix spike, CCN = WG23056-1 (54MW5S) and the sample matrix spike duplicate, CCN = WG23056-2 (54MW5SD) were found to be outside control limits for arsenic. The reported concentrations for this analyte are flagged with an "N" on all associated Form 1 and on Form 5a.

An "N" indicates a matrix-related interference in the sample preparation procedure &/or analysis for the flagged analyte. This is normally the consequence of a relatively high anionic content in the sample or (for some sediments) an inconsistent sample matrix relative to that analyte.

SW-846 control limits for matrix spike recoveries are set at 75% to 125% of the analyte quantity added unless original sample concentrations exceed the true values of these "spikes" by a factor of four or more. In this case, affected analytes are not flagged even if recoveries are outside percentage recovery control limits.

The sample matrix duplicate, CCN = WG23056-3 (54MW5D) was inside control limits for the requested analytes.

SW-846 control limits for duplicate determinations are +/- 20% Relative Percent Difference (RPD) for concentrations greater than or equal to five times the PQL in both the original and duplicate samples, and +/- the PQL for concentrations less than five times the PQL. The RPD is not calculated if both the original and duplicate values fall below the IDL.

A five-fold serial dilution of sample, CCN = B2810-8 (54MW5L) was performed in accordance with SW-846 requirements for ICP analysis.

The adjusted sample concentrations were outside control limits for sodium, which is flagged with an "E" on all associated Form 1, the Cover Page and Form 9.

An "E" indicates that a chemical or physical interference effect was encountered during the analysis of the flagged analyte. As a result of this interference, all values for the analyte in the same matrix must be considered to be estimated quantities.

SW-846 control limits for serial dilution are defined as a deviation less than or equal to 10% in the dilution-adjusted concentrations from the original values for all analyte concentrations with values greater than fifty (50) times their respective Instrument Detection Limit (IDL) in the original sample.

The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Thomas R. Cole
Data Reviewer II
March 11, 2003

CompuChem
a Division of Liberty Analytical Corp.
501 Madison Avenue Cary, NC 27513

DATA REPORTING QUALIFIERS FOR INORGANICS

On Form I, under the column labeled "C" for concentration qualifier and "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. Up to five qualifiers may be reported on Form I for each analyte.

The C (concentration) qualifiers used are:

U: This flag indicates the analyte was analyzed for but not detected. This reported value was obtained from a reading that was less than the Instrument Detection Limit (IDL). The IDL will be adjusted to reflect any dilution and, for soils, the percent moisture.

B: This flag indicates the analyte was analyzed for and the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

The Q qualifiers used are:

E: This flag indicates an estimated value. This flag is used:

1. When the serial dilution (a five fold dilution for CLP and a five fold dilution for SW-846 method 6010B) results are not within 10%. The analyte concentration must be sufficiently high (minimally a factor of 50X above the IDL in the original sample).

N: This flag indicates the sample spike recovery is outside of control limits.

***:** This flag is used for duplicate analysis when the sample and the sample duplicate results are not within control limits.

The extensions: D, S, SD, L. A, added to the end of the client ID represent as follows:

D:	matrix duplicate
S:	matrix spike
SD:	matrix spike duplicate
L:	serial dilution
A:	post digestion spike

Method Codes:

P:	ICP PLASMA
CV:	MERCURY COLD VAPOR AA
CA:	MIDI-DISTILLATION SPECTROPHOTOMETRIC

COMPUCHEM a Divison of Liberty Analytical
COMMERCIAL RECEIVING LOG

Page _____ of _____

Client: URS
Project: Radford
Quote: Q2810
Login No. A2810
Subcontract? Y / (N)
TAT Verbal _____ Report (3)

Rec'd Date: 3/4/3
Courier: Fedex
Airbill No. 8329 4753 9040

PPS/RFA 1253

Lab Instructions

Cooler Rec'd By: C Sullo
Sample Login By:
Temperature: 2 °C
Cyanide Samples checked for sulfide & chlorine? Y / (NA)
Phenol Samples checked for chlorine? Y (NA)
Received in Good Condition? (Y) / N
If no, explain:

Parameters

CompuChem ID	Client ID	QC	Matrix	Dil 2003	Military Time	SVOCs PAHs Explosives No. & Type	pH	Total Metals No. & Type	pH	Dissolved Metals No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type
A2810-1	GW-EB-1		WA	3	1530	6-AL		1-PL												
↓ -2	54MW6		↓		1505	↓		↓												
B2810-1	GW-EB-1				1530					1-PL										
↓ -2	54MW6		↓	↓	1505					1-PL										

3/4/3
IC

Abbreviations: 10ml (40ml vial) AL (Amber Liter) PL (Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER _____

111 - 6/28/01 dcc

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1060

Project Number	Project Name
69604-3170	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Copen

LAB: 16

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
GW/EB-1	3/3/03 1530	5		X	2	E	F/U	8		X	X			X		X							Dissolved Metals as well

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/3/03 1500				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 3-3-03 9:40	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1058

Project Number	Project Name
07604.310	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Brett Fisher / Cooper

LAB: 17

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or (Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW6	3/3/05 1505	5		X	2	E	F	8		X	X			X		X							Total Dissolved metals is also included
																							No Lgl concentrations are expected.

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	3/3/05 1840				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time 3-4-05 9:40	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

COMPUCHEM a Divison of Liberty Analytical Page 1 of 1

COMMERCIAL RECEIVING LOG

Client: ULS	Rec'd Date: 3/5/03	PPS/RFA
Project: DFAAP	Courier: Fed Ex	Lab Instructions
Quote: 47810	Airbill No. 8329 4253 9951	8329 4253 9892
Login No. B2810	8329 4253 9918	8329 4253 9929
Subcontract? Y / (N)	8329 4253 9870	8329 4253 9881
TAT Verbal Report 13	8329 4253 9940	8329 4253 9930
	8329 4253 9907	

Cooler Rec'd By: K. Grbala	
Sample Login By: C. Stoll	
Temperature: 2.0 °C	
Cyanide Samples checked for sulfide & chlorine? Y / (NA)	
Phenol Samples checked for chlorine? Y / (NA)	
Received in Good Condition? (Y) / N	
If no, explain:	

CompuChem ID	Client ID	QC	Matrix	Date 2003	Military Time	Parameters: Dissolved Metals — No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH	No. & Type	pH
B2810-3	GW/Dup-1		WA	3/4	—	1-PL	≤2												
-4	GW/EB-2				15:30														
-5	54MW2				15:10														
-6	54MW3				13:53														
-7	54MW4				12:30														
-8	54MW5	X			8:50	3-PL													
-9	54MW7				10:30	1-PL													

OS 3/5/03

Container Type Abbreviations: 40ml.(40ml. Vial) AL(Amber Liter) PL(Plastic Liter) 500P(500mL Plastic) 250P(250mL Plastic) OTHER _____

Radford Army Ammunition Plant

Chain Of Custody Record

Nº 1044

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Todd LaMarkin

Samplers: Fisher / Copen

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
GW/ER-2	3/4/03 1530	5		X	2	E/B	F/U	8		X	X			X		X							Dissolved Metals
																							Low level
																							[redacted]

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/03 1100				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Radford Army Ammunition Plant
Chain Of Custody Record

No 1052

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Copen

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW22	3/4/03 1510	5		X	2	6B	2	8			X			X		X							Dissolved Metals as well as high concentration

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other ____
H. NaHSO4 Ice
I. ZnAc + NOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/03 1700				
Relinquished by:	Date/Time	Received by: (for lab)	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1046

Project Number	Project Name
07604-310	RFAAP

Project Contact (Name and Phone Number): Todd Lamaski

Samplers: Fisher / Cooper

LAB: 1

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
GW/Dup.1	3/4/05 [redacted]	5		X	2	B	F	8		X	X			X		X							Dissolved metals as well. High concentrations expected.

Box #1			Box #2			Box #3	Box #4	
1. Surface Water	6. Trip Blank		A. HCl + Ice	F. Ice Only		F. Filtered	R. Rush - 3 Day	
2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other _____		U. Unfiltered	S. Standard 28 Day	
3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice			T. Timely 14 Day	
4. Rinsate	9. Other _____		D. H2SO4 + Ice	I. ZnAc + NaOH + Ice			O. Other _____	
5. Soil Sediment/Sludge			E. Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/03 1800				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant

Chain Of Custody Record

Nº 1051

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Copen

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
									ANALYSES														
54MW3	3/4/03 1355	5		X	2	6	F	8		X	X			X		X							Dissolved Metals as well

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/03 1600				
Relinquished by:	Date/time	Received by: (for lab) Vincent Bailey	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 20°C

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1050

Project Number	Project Name
97604-310	RFAAP

Project Contact (Name and Phone Number): Todd LaMookin

Samplers: Fisler / Copen

LAB: 1 of 1

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
SYMW4	3/4/03 1230	S		X	2	5/6	F/U	8		X	X			X		X							Total + Dissolved metals
																							High concentration expected

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
Butch Fisler	3/4/03 1700				
Relinquished by:	Date/time	Received by: (for lab) Marcine J. Bailey	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

No 1054

Project Number	Project Name
38074310	RFAAP

Project Contact (Name and Phone Number): Todd LaMeskin

Samplers: Fisher / Copen

LAB: 18

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW5	3/4/05 850	5		X	2	~~6~~	F/U	8		X	X			X		X							Metals is dissolved and undissolved total. High concentrations expected.

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	3/4/05 1800				
Relinquished by:	Date/time	Received by: (for lab) Lauren Bailey	Date/Time 3/5/05 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1055

Project Number	Project Name
07604310	RFAAP

Project Contact (Name and Phone Number): Todd LaMarkin

Samplers: Brad Fisher / Dave Copen

LAB: 8 1

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW3 MS	3/4/03 850	5		X	2	G	F/U	8		X	X			X		X							Metals is Dissolved and undissolved
																							High Concentrations are expected.

Box #1			Box #2			Box #3	Box #4	
1. Surface Water	6. Trip Blank		A. HCl + Ice	F. Ice Only		F. Filtered	R. Rush - 3 Day	
2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other _____		U. Unfiltered	S. Standard 28 Day	
3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice			T. Timely 14 Day	
4. Rinsate	9. Other _____		D. H2SO4 + Ice	I. ZnAc + NaOH + Ice			O. Other _____	
5. Soil Sediment/Sludge			E. Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brad Fisher	3/4/03 1800				
Relinquished by:	Date/time	Received by: (for lab) Laurene Baily	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp: 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1056

Project Number	Project Name
0964 310	RFRAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher/Copen

LAB: 18

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW5MSD	3/4/05 1550	5		X	2	E/B	F/U	8		X	X			X		X							Metals is dissolved and undissolved
																							high concentrations are expected.

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/05 1800				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 3/5/05 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 20°C

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1057

Project Number	Project Name
09604-510	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Copen

LAB: 8 1

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
SYMW-7	3/4/03 1030	5		X	2	F/B	F/L	8		X	X			X		X							Dissolved Metals as well. High concentrations expected.

ANALYSES

Box #1			Box #2			Box #3	Box #4	
1. Surface Water	6. Trip Blank		A. HCl + Ice	F. Ice Only		F. Filtered	R. Rush - 3 Day	
2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other _____		U. Unfiltered	S. Standard 28 Day	
3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice			T. Timely 14 Day	
4. Rinsate	9. Other _____		D. H2SO4 + Ice	I. ZnAc + NaOH + Ice			O. Other _____	
5. Soil Sediment/Sludge			E. Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Bill Fisher	3/4/03 1800				
Relinquished by:	Date/time	Received by: (for lab) Pauline Baily	Date/Time 3/5/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: ____Q2810_____ **Fraction:_SVOCs, PAH, Explosives,Nitroglycerin, Metals**

Lab: _CompuChem_____ **Project Name: __Radford SWMU 54_____**

Reviewer: _____RA, AJ_____ **Date: _____March 7, 2003_____**

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the SVOC analyses, the continuing calibrations analyzed on 12/11/02 and 12/12/02 displayed %Ds greater than the QC limit (i.e., 20%) with a negative bias for atrazine at 57.81% and 60.06%, respectively. All associated sample results were non-detects and were flagged "R,c."

For the explosive analyses, the LCS recoveries for 1,3,5-trinitrobenzne (49%) and nitrobenzene (45%) were less than the lower QC limit (i.e., 50%). All associated sample results were non-detects and were flagged "R,l." The percent completeness was less than the QC limit (i.e., 90%) at 86% due to this anomaly.

For the PAH analyses, the LCS recoveries for naphthalene (25%), acenaphthene (18%) and fluorene (48%) were less than the lower QC limit (i.e., 50%). Positive results were flagged "J,l" and non-detects and were flagged "R,l." The percent completeness was less than the QC limit (i.e., 90%) at 85% due to this anomaly.

Minor Anomalies: For the SVOC analyses, the initial calibration analyzed on 11/25/02 displayed %RSDs greater than the control limit (i.e., 15%) for benzaldehyde at 18.8%, 2,4-dimethylphenol at 17.4%, hexachlorocyclopentadiene at 17.6%, n-nitrosodiphenylamine at 15.8%, 4-chlorophenyl-phenylether at 18.7%, and atrazine at 69.7%. All associated sample results were non-detects and the only failures that were serious enough (i.e., >50%) to affect the non-detects were for atrazine. Atrazine non-detects were flagged "UJ,r" in the associated samples unless previously flagged due to continuing calibration failure.

The CCV analyzed on 12/11/02 at 1504 displayed %Ds greater than the control limit (i.e., 20%) with a negative bias for 2-methylnaphthalene at 24.08%, hexachlorocyclopentadiene at 29.97%, 4-nitrophenol at 22.97%, dibenzofuran at 20.34%, and 4-chlorophenyl-phenylether at 26.57%. The CCV analyzed on

12/12/02 at 1355 displayed %Ds greater than the control limit with a negative bias for 2-methylnaphthalene at 23.81% and with a positive bias for acenaphthylene at 23%. The CCV analyzed on 12/13/02 at 0915 displayed %Ds greater than the control limit with a negative bias for at atrazine at 41.09% and with a positive bias for dimethylphthalate at 20.01%, 3-nitroaniline at 34.23%, diethylphthalate at 22.32%, 4-nitroaniline at 26.67%, and benzo(b)fluoranthene at 22.87%. Non-detects were flagged "UJ,c" for the failures associated with negative biases unless previously flagged due to other anomalies. No positive results were reported for failures associated with positive biases and no data qualifying action was required.

The method blanks contained fluoranthene at 27 ug/Kg and bis(2-ethylhexyl)phthalate at 35 ug/Kg. Positive results were flagged "B,z" in the associated samples. Equipment blank EQB-11 contained bis(2-ethylhexyl)phthalate at 10 ug/L. Positive results were previously flagged due to method blank contamination and no further data qualifying action was required.

The MS/MSD recoveries for 4-nitroaniline (110%/120%) were greater than the upper QC limits. The MSD and %RPD for dibenzofuran (120%/38%) and the %RPDs for 2-methylnaphthalene (38%) and fluorene (35%) were greater than the upper QC limits. No positive results were reported in the parent sample 54SB23B and no data qualifying action was required.

The LCS recoveries for 3-nitoaniline (118%) and 4-nitroaniline (121%) were greater than the upper QC limit. No positive results were reported for these compounds and no data qualifying action was required.

For the PAH analyses, the method blanks contained acenaphthene at 240 ug/Kg, fluoranthene at 6.2 ug/Kg and 8.2 ug/Kg, benzo(b)fluoranthene at 8.7 ug/Kg, dibenzo(a,h)anthracene at 5.8 ug/Kg, benzo(g,h,i)perylene at 6.2 ug/Kg, benzo(a)pyrene at 4.5 ug/Kg, and indeno(1,2,3-cd)pyrene at 8.4 ug/Kg. Positive results less than 5 times the blank concentration were flagged "B,z" in the associated samples.

The recoveries for surrogate p-terphenyl (41%/38%) in sample 54SB24B were less than the lower QC limit. Positive results were flagged "L,s" and non-detects were flagged "UL,s", unless previously flagged due to other anomalies.

The MS/MSD recoveries for naphthalene (25%/44%) and acenaphthene (-51%/-25%) and the MSD recovery for acenaphthylene (-2%) were less than the lower QC limits. All associated results were positive in the parent sample 54SB23B and were flagged "J,m" unless previously flagged due to other anomalies. The %RPDs for all compounds except naphthalene were greater than the QC limit. Positive results were previously flagged in the parent sample 54SB23B and no further data qualifying action was required.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for some compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

Fluoranthene exceeded the calibration range in sample 54SB20B and was flagged "E" by the laboratory. This result was previously flagged "J,g" and no further data qualifying action was required. This sample was not reanalyzed at a dilution since the lower result between the two columns was originally reported by the laboratory. Subsequently, upon URS request, the laboratory re-evaluated and re-submitted these results based on the SW-846 requirement of reporting the higher concentration.

For the explosives analyses, the continuing calibration analyzed on 12/15/02 at 1408 displayed a %D greater than the QC limit (i.e., 15%) with a negative bias for tetryl at 28.34% on the initial column. The continuing calibration analyzed on 12/16/02 at 0845 displayed a %D greater than the QC limit with a negative bias for tetryl at 29.8%. Non-detects were flagged "UJ,c" in the associated samples. The continuing calibration analyzed on 12/25/02 at 0813 displayed a %D greater than the QC limit with a negative bias for RDX at 17.48%. No data qualifying action was required since the associated results were non-detects and the %D was acceptable on the other column.

The MSD recovery for 2,4,6-trinitrotoluene (250%) was greater than the upper QC limit. No data qualifying action was required since the sample concentration was greater than 4 times the spiking amount. The RPDs for 1,3,5-trinitrobenzene (42%), 2,4,6-trinitrotoluene (42%), and 4-nitrotoluene (34%) were greater than the QC limit. Positive results were flagged "J,d" in the associated samples.

For the metal analyses, the initial CRDL percent recoveries for cadmium (116%), chromium (84.4%), copper (69%), and sodium (78%) were outside the control limit (i.e., 90-110%). No positive results were reported for cadmium and no data qualifying action was required. Positive results less than 2xCRDL were flagged "L,w" for sodium in the associated samples. All associated sample results were greater than 2xCRDL for chromium and copper and no data qualifying action was required.

The method blank contained barium at 0.043 mg/Kg, magnesium at 6.681 mg/Kg, potassium at 12.809 mg/Kg, and zinc at 0.181 mg/Kg. All associated sample results were greater than 5 times the blank concentration and no data qualifying action was required.

The initial and continuing calibration blanks also contained positive results for barium, magnesium, beryllium, calcium, iron, manganese, potassium and zinc.

All associated sample results were greater than 5 times the blank concentration and no data qualifying action was required.

Equipment blank EQB-10 located in SDG R2810 contained chromium at 0.77 ug/L and sodium at 253 ug/L. All associated sample results were greater than 5 times the blank concentration and no data qualifying action was required.

The RPD for the laboratory duplicate analysis was greater than the QC limit (i.e., 35%) for lead at 44.3%. Positive results were flagged "J,k."

The MS and/or MSD recoveries analyzed on sample 54SB23B were outside the QC limit for antimony (31.9%/32.2%), cadmium (74.1%), lead (159.2%/135.1%), selenium (69%) and thallium (59.5%/61.7%). Positive lead results were previously flagged due to laboratory duplicate anomalies and no further data qualifying action was required. Positive results were flagged "L,m" and non-detects were flagged "UL,m" for the other analytes unless previously flagged due to other anomalies.

The %Ds for the serial dilution analysis were greater than the QC limit (i.e., 10%) for barium (11.2%), calcium (14.2%), iron (13%), magnesium (13.8%), manganese (12.7%), potassium (17.8%) and zinc (17.4%). Positive results were flagged "J,s", unless previously flagged due to other anomalies.

The RPD for copper was greater than the QC limit (i.e., 35%) for the field duplicate pair D-10/54SB21B at 73%. No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

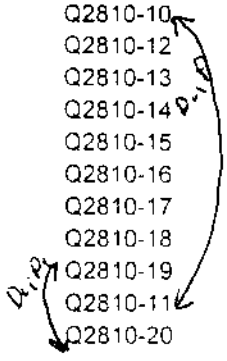
Correctable Anomalies: None.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were raised.

Positive TIC results were flagged "NJ,t" in the associated samples. It should be noted that if a given fraction (analysis) is not discussed in this report, it indicates that no anomalies were observed for that fraction. Except for data flagged "R", all data, as qualified, are usable for their intended purpose based on the data reviewed.

Signed: Ranjan

SAMPLENUM	CLIENTID	QUOTENUMREF	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
Q2810-1	54SB17A	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-2	54SB17B	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-3	54SB18A	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-4	54SB18B	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-5	54SB19A	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-6	54SB19B	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-7	54SB20A	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-8	54SB20B	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-9	54SB21A	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-10	54SB21B	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-12	54SB22A	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/4/02
Q2810-13	54SB22B	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/4/02
Q2810-14	54SB23A	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/4/02
Q2810-15	54SB23B	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/4/02
Q2810-16	54SB24A	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/4/02
Q2810-17	54SB24B	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/4/02
Q2810-18	54SB26A	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/4/02
Q2810-19	54SB26B	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/4/02
Q2810-11	D-10	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/3/02
Q2810-20	D-7	Q2810	Q2810	SO	URS	RADFORD SWMU 54	12/4/02



FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB17A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-1A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB17A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-1A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	57	J
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB17A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-1A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	340	JB
2.		UNKNOWN (BC)	5.66	800	JB
3.		UNKNOWN (BC)	6.97	180	JB
4.		UNKNOWN SILOXANE	7.46	190	J
5.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB17B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-2A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U UJ,C
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB17B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-2A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 20 decanted: (Y/N) N Date Extracted: 12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	830	U UJ,C
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U UJ,C
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U UJ,C
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	U R, C
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	410	U
206-44-0	Fluoranthene	45	JB B, C
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	410	U
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-octylphthalate	410	U
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB17B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-2A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	310	JB
2.		UNKNOWN (BC)	5.66	750	JB
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB18A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-3A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U UJ,C
77-47-4	Hexachlorocyclopentadiene	390	U ↓
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB18A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-3A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U UJ, C
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U UJ, C
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U UJ, C
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U R, C
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	390	U
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB18A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-3A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	380	JB
2.		UNKNOWN (BC)	5.66	820	JB
3.	541-02-6	CYCLOPENTASILOXANE, DECAMETH	7.46	190	NJ
4.		UNKNOWN	18.66	180	J
5.		UNKNOWN	18.70	430	J
6.		UNKNOWN	20.56	640	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB18B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-4A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U UJ,C
77-47-4	Hexachlorocyclopentadiene	400	U ↓
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB18B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-4A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U J, C
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U J, C
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U J, C
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R, C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB18B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-4A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.39~~	~~320~~	~~JB~~
2.		UNKNOWN (BC) RT 12.03	5.66	730	JB
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB19A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-5A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB19A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-5A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U UJ, C
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U UJ, C
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U UJ, C
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R, C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphtnalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB19A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-5A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	250	JB
2.		UNKNOWN (BC)	5.66	520	JB
3.		UNKNOWN	7.46	200	J
4.		UNKNOWN	16.40	440	J
5.		UNKNOWN	22.38	240	J
6.		UNKNOWN	22.58	310	J
7.	2435-85-0	PYRENE, HEXADECAHYDRO-	22.80	220	NJ
8.		UNKNOWN	23.02	370	J
9.		UNKNOWN	23.49	240	J
10.		UNKNOWN	23.56	460	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB19B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-6A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	420	U

FORM I SV 8270C

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB19B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-6A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	840	U UJ,C
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U UJ,C
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U UJ,C
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	420	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	U R,C
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	52	J
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	U
206-44-0	Fluoranthene	340	JB
129-00-0	Pyrene	220	J
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	420	U
56-55-3	Benzo(a)anthracene	70	J
218-01-9	Chrysene	120	J
117-84-0	Di-n-octylphthalate	420	U
205-99-2	Benzo(b)fluoranthene	75	J
207-08-9	Benzo(k)fluoranthene	77	J
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	420	U
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	420	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB19B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-6A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.39	~~280~~	~~JB~~
2.		UNKNOWN (BC)	5.66	530	JB
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB20A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-7A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U JI/C
77-47-4	Hexachlorocyclopentadiene	390	U ↓
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB20A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-7A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U UJ,C
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U UJ,C
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U UJ,C
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U R,C
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	390	U
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB20A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-7A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.38	320	~~JB~~
2.		UNKNOWN (BC)	5.66	530	JB
3.		~~UNKNOWN (BC)~~ R.A = 2.4	6.93	200	JB
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB20B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-8JA64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U w/c
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB20B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-8JA64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R,C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	92	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	300	J
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB20B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-8JA64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.36	310	JB
2.		UNKNOWN (BC)	5.64	670	JB
3.		UNKNOWN	6.95	340	J
4.		UNKNOWN SILOXANE	7.44	230	J
5.		UNKNOWN CARBOXYLIC ACID	18.99	220	J
6.		UNKNOWN	19.12	480	J
7.		UNKNOWN	19.24	250	J
8.		UNKNOWN	19.26	360	J
9.		UNKNOWN	19.29	910	J
10.		UNKNOWN	19.41	600	J
11.		UNKNOWN CARBOXYLIC ACID	19.43	680	J
12.		UNKNOWN	19.48	570	J
13.		UNKNOWN	19.53	650	J
14.		UNKNOWN	19.61	780	J
15.		UNKNOWN	19.67	700	J
16.		UNKNOWN	19.72	390	J
17.		UNKNOWN CARBOXYLIC ACID	19.75	500	J
18.		UNKNOWN	19.82	480	J
19.		UNKNOWN CARBOXYLIC ACID	19.90	330	J
20.		UNKNOWN CARBOXYLIC ACID	19.95	270	J
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

RA 2.1-4.0

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB21A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-9A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U W/C
77-47-4	Hexachlorocyclopentadiene	400	U ↓
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB21A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-9A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U UJ,C
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U UJ,C
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U UJ,C
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R,C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	75	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	150	J
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB21A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-9A64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	330	JB
2.		UNKNOWN (BC)	5.66	600	JB
3.		UNKNOWN (BC)	6.92	260	JB
4.		UNKNOWN (BC)	7.28	170	JB
5.		UNKNOWN	19.17	180	J
6.		UNKNOWN	19.29	180	J
7.		UNKNOWN CARBOXYLIC ACID	19.34	480	J
8.		UNKNOWN	19.42	230	J
9.		UNKNOWN CARBOXYLIC ACID	19.48	520	J
10.		UNKNOWN	19.53	210	J
11.		UNKNOWN	19.56	280	J
12.		UNKNOWN	19.61	170	J
13.		UNKNOWN	19.66	430	J
14.		UNKNOWN CARBOXYLIC ACID	19.69	380	J
15.		UNKNOWN	19.78	400	J
16.		UNKNOWN CARBOXYLIC ACID	19.85	280	J
17.					
18.					
19.					
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30.					

2A 12/4/02

FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB21B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-10JA64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U UJ,C
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB21B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-10JA64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	780	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U R/C
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	95	J
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB21B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-10JA64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 15 decanted: (Y/N) N Date Extracted: 12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~ (BC)	5.35	380	JB
2.		UNKNOWN ~~(BC)~~	5.64	720	JB
3.		UNKNOWN	6.94	340	J
4.		~~UNKNOWN~~	10.86	220	J
5.	10544-50-0	SULFUR, MOL. (S8)	14.07	320	NJ NJC
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
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27.					
28.					
29.					
30.					

FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

S4SB22A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-12A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U QJ, C
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB22A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-12A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R,C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	150	JB B,=
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB22A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-12A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.35	370	JB
2.		UNKNOWN (BC)	5.64	600	JB
3.		UNKNOWN	6.91	350	J
4.		UNKNOWN	6.96	180	J
5.		UNKNOWN (BC)	7.26	200	JB
6.		UNKNOWN (BC)	7.65	200	JB
7.		UNKNOWN	9.15	170	J
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RA 2124103

FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB22B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-13A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U 01/C
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB22B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-13A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	UR,C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	190	JB,C
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB22B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-13A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 12

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.36	340	JB
2.		UNKNOWN (BC)	5.64	620	JB
3.		UNKNOWN (BC)	6.89	390	JB
4.		UNKNOWN	6.94	170	J
5.		UNKNOWN (BC)	7.27	210	JB
6.		UNKNOWN (BC)	7.64	220	JB
7.		UNKNOWN CARBOXYLIC ACID	17.89	210	J
8.		UNKNOWN	18.20	300	J
9.	10152-69-9	CYCLOPROPANENONANOIC ACID, 2	18.26	590	NJ NJ
10.		UNKNOWN PHTHALATE	18.40	260	J
11.		UNKNOWN PHTHALATE	18.53	160	J
12.		UNKNOWN PHTHALATE	18.63	380	J
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RT 5.27 12/12/02

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB23A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-14A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U UJ/C
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB23A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-14A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	830	U
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	U R,C
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	410	U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	85	JB B,C
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-octylphthalate	200	J
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB23A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-14A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.35	420	JB
2.		UNKNOWN (BC)	5.64	780	JB
3.		UNKNOWN	6.91	650	J
4.		UNKNOWN (BC)	7.28	260	JB
5.		UNKNOWN ALKANE	18.87	210	J
6.		UNKNOWN	19.12	340	J
7.		UNKNOWN	19.26	250	J
8.		UNKNOWN PHTHALATE	19.29	650	J
9.		UNKNOWN AMIDE	19.37	330	J
10.		UNKNOWN	19.44	610	J
11.		UNKNOWN PAH	19.51	420	J
12.		UNKNOWN	19.53	430	J
13.		UNKNOWN	19.58	250	J
14.		UNKNOWN	19.61	510	J
15.	28553-12-0	1,2-BENZENEDICARBOXYLIC ACID	19.66	540	NJ
16.		UNKNOWN	19.71	300	J
17.		UNKNOWN CARBOXYLIC ACID	19.75	390	J
18.		UNKNOWN PHTHALATE	19.81	380	J
19.		UNKNOWN PHTHALATE	19.90	270	J
20.		UNKNOWN	19.95	270	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB23B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-15A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U W,C
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	1000	
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB23B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-15A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	810	U
121-14-2	2,4-Dinitrotoluene	950	
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	810	U
534-52-1	4,6-Dinitro-2-methylphenol	810	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	U R IC
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	37	J
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	2200	B
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-octylphthalate	410	U
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB23B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-15A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.36	410	JB
2.		UNKNOWN (BC)	5.63	690	JB
3.		UNKNOWN	6.91	200	J
4.		UNKNOWN	6.94	260	J
5.	610-39-9	BENZENE, 4-METHYL-1,2-DINITR	10.31	190	NJ NJ
6.		UNKNOWN	10.88	180	J
7.		UNKNOWN	10.95	8000	J
8.		UNKNOWN	12.32	180	J
9.		UNKNOWN	12.75	340	J
10.		UNKNOWN	13.36	380	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB24A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-16JA64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB24A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-16JA64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	780	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	120	JB
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	220	J
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB24A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-16JA64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 19

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.66	850	JB
2.		UNKNOWN	6.84	170	J
3.		UNKNOWN	6.96	500	J
4.		UNKNOWN	7.33	340	J
5.		UNKNOWN	10.88	390	J
6.	10544-50-0	SULFUR, MOL. (S8)	14.09	720	NJ
7.		UNKNOWN CARBOXYLIC ACID	16.99	190	J
8.		UNKNOWN	18.88	250	J
9.		UNKNOWN PHTHALATE	19.31	410	J
10.		UNKNOWN	19.63	260	J
11.		UNKNOWN PHTHALATE	19.68	340	J
12.		UNKNOWN PHTHALATE	19.76	370	J
13.		UNKNOWN PHTHALATE	19.83	260	J
14.		UNKNOWN	19.96	230	J
15.		UNKNOWN	20.96	210	J
16.	83-47-6	.GAMMA.-SITOSTEROL	22.14	440	NJ
17.	1058-61-3	STIGMAST-4-EN-3-ONE	22.77	250	NJ
18.		UNKNOWN	23.77	240	J
19.		UNKNOWN	24.31	160	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB24B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-17A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U JTC
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB24B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-17A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	840	U
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	420	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	U R,C
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	420	U
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	U
206-44-0	Fluoranthene	420	U
129-00-0	Pyrene	420	U
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	95	JB
56-55-3	Benzo(a)anthracene	420	U
218-01-9	Chrysene	420	U
117-84-0	Di-n-octylphthalate	420	U
205-99-2	Benzo(b)fluoranthene	420	U
207-08-9	Benzo(k)fluoranthene	420	U
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	29	J
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	420	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB24B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-17A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.35	540	JB
2.		UNKNOWN (BC)	5.64	190	JB
3.		UNKNOWN	6.94	240	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB26A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-18A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	760	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	760	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB26A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-18A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	760	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	270	J
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	760	U
534-52-1	4,6-Dinitro-2-methylphenol	760	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U R,C
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	84	JB B,Z
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB26A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-18A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.35	450	JB
2.		UNKNOWN (BC)	5.64	720	JB
3.		UNKNOWN	6.94	250	J
4.		UNKNOWN	9.15	440	J
5.		UNKNOWN PAH	9.29	170	J
6.		UNKNOWN	19.61	160	J
7.	56554-90-6	13-OCTADECENAL	19.64	160	NJ
8.		UNKNOWN	22.11	190	J
9.		UNKNOWN	22.23	250	J
10.	5945-53-9	D:C-FRIEDOOLEANAN-3-ONE	22.43	510	NJ
11.		UNKNOWN	22.75	260	J
12.		UNKNOWN	22.85	320	J
13.		UNKNOWN	22.92	260	J
14.		UNKNOWN	22.97	260	J
15.		UNKNOWN	23.45	410	J
16.		UNKNOWN	23.51	1200	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB26B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-19A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB26B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-19A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U UJ,C
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	390	U
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB26B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-19A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~ (BC)	5.35	~~550~~	JB
2.		UNKNOWN (BC)	5.64	750	JB
3.		UNKNOWN (BC)	6.96	200	JB
4.					
5.					
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30.					

FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-10

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-11JA64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U VJ/C
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-10

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-11JA64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R, C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	46	J B, C
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	55	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-10

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-11JA64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/04/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/12/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.36	400	JB
2.		UNKNOWN (BC)	5.64	730	JB
3.		UNKNOWN	6.94	360	J
4.		UNKNOWN	10.86	410	J
5.	10544-50-0	SULFUR, MOL. (S8)	14.07	740	NJ
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-7

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-20A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-7

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-20A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U WJR
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	43	JB
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-7

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: Q2810-20A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/08/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.37	480	JB
2.		UNKNOWN (BC)	5.66	780	JB
3.		UNKNOWN	6.93	210	J
4.		UNKNOWN	6.96	210	J
5.					
6.					
7.					
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1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB17A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U R, Q
83-32-9	Acenaphthene	61	P J, Q
86-73-7	Fluorene	51	U R, Q
129-00-0	Pyrene	24	
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	39	B, Z
218-01-9	Chrysene	9.3	J
205-99-2	Benzo(b)fluoranthene	5.2	J
207-08-9	Benzo(k)fluoranthene	4.2	J
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	8.8	J
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB17B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	23	J J, 2
83-32-9	Acenaphthene	52	U U, 2
86-73-7	Fluorene	52	U U, 2
129-00-0	Pyrene	24	P J, 3
85-01-8	Phenanthrene	52	U
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	24	B B, 2
218-01-9	Chrysene	13	
205-99-2	Benzo(b)fluoranthene	5.2	J
207-08-9	Benzo(k)fluoranthene	5.1	JP J, 3
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	17	
50-32-8	Benzo(a)pyrene	2.6	J
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	52	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB18A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	50	U K, L
83-32-9	Acenaphthene	53	P J, X
86-73-7	Fluorene	50	U K, X
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	50	U
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	9.2	JB B, E
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	9.9	U
207-08-9	Benzo(k)fluoranthene	9.9	U
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	9.9	U
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	36	JP J, G

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB18B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U R,X
83-32-9	Acenaphthene	51	U ↓
86-73-7	Fluorene	51	U ↓
129-00-0	Pyrene	15	JP J,X
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	13	JB B,Z
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	10	J

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB19A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	130	P J,2
83-32-9	Acenaphthene	51	U R,2
86-73-7	Fluorene	51	U
129-00-0	Pyrene	18	J
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	30	B B,2
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	3.7	JP J,8
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	8.9	JP J,8
50-32-8	Benzo(a)pyrene	3.4	J
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB19B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	53	U R,P
83-32-9	Acenaphthene	27	JP J,P
86-73-7	Fluorene	53	U R,P
129-00-0	Pyrene	22	U
85-01-8	Phenanthrene	53	U
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	5.8	JB B,P
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	53	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB20A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	50	U R,S
83-32-9	Acenaphthene	50	U ↓
86-73-7	Fluorene	50	U ↓
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	50	U
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	5.3	JB B, ≠
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	9.9	U
207-08-9	Benzo(k)fluoranthene	9.9	U
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	9.9	U
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	50	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB20B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U R,J
83-32-9	Acenaphthene	170	P J
86-73-7	Fluorene	26	JP
129-00-0	Pyrene	320	
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	15	J
206-44-0	Fluoranthene	460	EBP J,J
218-01-9	Chrysene	19	P
205-99-2	Benzo(b)fluoranthene	110	P
207-08-9	Benzo(k)fluoranthene	120	
53-70-3	Dibenzo(a,h)anthracene	30	P J,J
191-24-2	Benzo(g,h,i)perylene	32	
56-55-3	Benzo(a)anthracene	80	P J,J
50-32-8	Benzo(a)pyrene	42	P
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	43	JP J,J

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB21A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	C
91-20-3	Naphthalene	130	P J, J
83-32-9	Acenaphthene	76	P
86-73-7	Fluorene	51	U R, R
129-00-0	Pyrene	70	
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	4.8	JBP B, E
218-01-9	Chrysene	42	
205-99-2	Benzo(b)fluoranthene	28	
207-08-9	Benzo(k)fluoranthene	30	P J, J
53-70-3	Dibenzo(a,h)anthracene	16	P
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	40	
50-32-8	Benzo(a)pyrene	9.7	J
193-39-5	Indeno(1,2,3-cd)pyrene	14	P J, J
208-96-8	Acenaphthylene	22	JP

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB21B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U R,9
83-32-9	Acenaphthene	49	U ↓
86-73-7	Fluorene	49	U ↓
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.8	U
205-99-2	Benzo(b)fluoranthene	9.8	U
207-08-9	Benzo(k)fluoranthene	9.8	U
53-70-3	Dibenzo(a,h)anthracene	9.8	U
191-24-2	Benzo(g,h,i)perylene	9.8	U
56-55-3	Benzo(a)anthracene	9.8	U
50-32-8	Benzo(a)pyrene	9.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.8	U
208-96-8	Acenaphthylene	49	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB22A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	14	JP
85-01-8	Phenanthrene	27	J
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	28	BP
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB22B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U R,2
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	21	U
85-01-8	Phenanthrene	11	J
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	7.8	JB B,2
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB23A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	52	U P,C
83-32-9	Acenaphthene	52	U
86-73-7	Fluorene	52	U
129-00-0	Pyrene	13	J
85-01-8	Phenanthrene	52	U
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	27	B B,Z
218-01-9	Chrysene	5.7	J
205-99-2	Benzo(b)fluoranthene	9.8	JB B,Z
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	4.9	J
50-32-8	Benzo(a)pyrene	8.5	JB B,Z
193-39-5	Indeno(1,2,3-cd)pyrene	14	BP
208-96-8	Acenaphthylene	52	U

AMENDED DATA

022

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB23B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/08/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	760	J, M
83-32-9	Acenaphthene	400	BP B, Z
86-73-7	Fluorene	52	U
129-00-0	Pyrene	21	U
85-01-8	Phenanthrene	52	U
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	10	JB B, Z
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	41	JP J, M

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB24A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/08/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	170	P J, g
83-32-9	Acenaphthene	49	U R, g
86-73-7	Fluorene	49	U
129-00-0	Pyrene	35	
85-01-8	Phenanthrene	24	J
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	57	BP J, g
218-01-9	Chrysene	16	
205-99-2	Benzo(b)fluoranthene	18	BP B, g
207-08-9	Benzo(k)fluoranthene	40	P J, g
53-70-3	Dibenzo(a,h)anthracene	36	BP J, g
191-24-2	Benzo(g,h,i)perylene	32	BP J, g
56-55-3	Benzo(a)anthracene	15	
50-32-8	Benzo(a)pyrene	19	B B, g
193-39-5	Indeno(1,2,3-cd)pyrene	110	BP
208-96-8	Acenaphthylene	49	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB24B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/08/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	53	U R,L
83-32-9	Acenaphthene	260	BP B,Z
86-73-7	Fluorene	53	U R,L
129-00-0	Pyrene	110	P J,J
85-01-8	Phenanthrene	53	U UL,S
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	11	JB B,Z
218-01-9	Chrysene	10	U UL,S
205-99-2	Benzo(b)fluoranthene	4.9	JB B,Z
207-08-9	Benzo(k)fluoranthene	5.8	JP J,J
53-70-3	Dibenzo(a,h)anthracene	10	U UL,S
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	5.9	JBP B,Z
208-96-8	Acenaphthylene	53	U UL,S

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB26A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 13 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/08/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	48	U R, Q
83-32-9	Acenaphthene	81	BP B, Z
86-73-7	Fluorene	48	U R, Q
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	48	U
120-12-7	Anthracene	48	U
206-44-0	Fluoranthene	23	B B, Z
218-01-9	Chrysene	4.5	J
205-99-2	Benzo(b)fluoranthene	5.9	JBP B, Z
207-08-9	Benzo(k)fluoranthene	9.5	U
53-70-3	Dibenzo(a,h)anthracene	9.5	U
191-24-2	Benzo(g,h,i)perylene	9.5	U
56-55-3	Benzo(a)anthracene	4.4	J
50-32-8	Benzo(a)pyrene	9.5	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.5	U
208-96-8	Acenaphthylene	48	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB26B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/08/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U R,P
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	9.4	J
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-10

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/04/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U R, f
83-32-9	Acenaphthene	51	U ↓
86-73-7	Fluorene	51	U ↓
129-00-0	Pyrene	14	JP J, j
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	16	JB B, =
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-7

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/08/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	50	U R, X
83-32-9	Acenaphthene	50	U ↓
86-73-7	Fluorene	50	U ✓
129-00-0	Pyrene	10	J
85-01-8	Phenanthrene	50	U
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	6.2	JB B, Z
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	9.9	U
207-08-9	Benzo(k)fluoranthene	9.9	U
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	9.9	U
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	50	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB17A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R,Q
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB17B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR, L
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	UR, L
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB18A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, J
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R, J
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB18B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, J
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R, J
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB19A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	UR, Q
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB19B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,X
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R,X
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB20A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U UJ/C
98-95-3	Nitrobenzene	1.0	UR, Q
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB20B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, C
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U J, C
98-95-3	Nitrobenzene	1.0	U R, C
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB21A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB21B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR,J
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	UUJ,C
98-95-3	Nitrobenzene	1.0	UR,J
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB22A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U UJ,C
98-95-3	Nitrobenzene	1.0	U R,Q
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB22B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB23A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,J
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U J,C
98-95-3	Nitrobenzene	1.0	U R,J
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB23B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	15	J,d
479-45-8	Tetryl	2.0	U J,C
98-95-3	Nitrobenzene	1.0	U R,Q
121-14-2	2,4-Dinitrotoluene	0.92	J
606-20-2	2,6-Dinitrotoluene	1.1	J
35572-78-2	2-Amino-4,6-dinitrotoluene	0.78	J
1946-51-0	4-Amino-2,6-dinitrotoluene	0.99	J
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB24A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/16/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U J, C
98-95-3	Nitrobenzene	1.0	UR, Q
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB24B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/16/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR, J
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	UJ, C
98-95-3	Nitrobenzene	1.0	UR, J
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB26A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/16/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,X
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U UJ,C
98-95-3	Nitrobenzene	1.0	U R,X
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB26B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/16/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-10

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-7

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/16/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB17A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB17B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB18A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB18B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB19A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB19B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB20A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB20B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB21A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB21B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB22A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB22B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB23A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB23B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB24A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB24B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB26A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB26B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-10

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

042

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-7

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: Q2810-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB23BMS

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: WG21791-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	6.8	J

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB23BMSD

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: Q2810

Matrix: (soil/water) SOIL Lab Sample ID: WG21791-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	7.9	J

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB17A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-1

Level (low/med): LOW Date Received: 12/3/02

% Solids: 83.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9210			P	
7440-36-0	Antimony	0.43	U	N	P	UL, M
7440-38-2	Arsenic	1.0	B		P	
7440-39-3	Barium	145		E	P	
7440-41-7	Beryllium	0.74			P	
7440-43-9	Cadmium	0.05	U	N	P	UL, M
7440-70-2	Calcium	1440		E	P	J/S
7440-47-3	Chromium	16.4			P	
7440-48-4	Cobalt	6.7		E	P	J/S
7440-50-8	Copper	7.1			P	
7439-89-6	Iron	14700		E	P	J/S
7439-92-1	Lead	21.2		N*	P	J/K
7439-95-4	Magnesium	2450		E	P	J/S
7439-96-5	Manganese	543		E	P	J/S
7439-97-6	Mercury	0.057			CV	
7440-02-0	Nickel	10.8			P	
7440-09-7	Potassium	954		E	P	J/S
7782-49-2	Selenium	1.1		N	P	L, M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	217	B		P	L, W
7440-28-0	Thallium	0.60	U	N	P	UL, M
7440-62-2	Vanadium	20.8			P	
7440-66-6	Zinc	91.4		*E	P	J/S

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB17B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-2

Level (low/med): LOW Date Received: 12/3/02

% Solids: 79.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17000			P	
7440-36-0	Antimony	0.45	U	N	P	UL,M
7440-38-2	Arsenic	1.6			P	
7440-39-3	Barium	178		E	P	J,S
7440-41-7	Beryllium	1.1			P	
7440-43-9	Cadmium	0.05	U	N	P	UL,M
7440-70-2	Calcium	1870		E	P	J,S
7440-47-3	Chromium	23.6			P	
7440-48-4	Cobalt	11.1		E	P	J,S
7440-50-8	Copper	19.8			P	
7439-89-6	Iron	22500		E	P	J,S
7439-92-1	Lead	10.9		N*	P	J,K
7439-95-4	Magnesium	3820		E	P	J,S
7439-96-5	Manganese	691		E	P	↓
7439-97-6	Mercury	0.047			CV	
7440-02-0	Nickel	16.0			P	
7440-09-7	Potassium	1240		E	P	J,S
7782-49-2	Selenium	1.2		N	P	L,M
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	235	B		P	L,W
7440-28-0	Thallium	0.62	U	N	P	UL,M
7440-62-2	Vanadium	36.4			P	
7440-66-6	Zinc	69.2		*E	P	J,S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB18A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-3

Level (low/med): LOW Date Received: 12/3/02

% Solids: 84.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	8050			P	
7440-36-0	Antimony	0.42	U	N	P	UL, M
7440-38-2	Arsenic	1.0	B		P	
7440-39-3	Barium	155		E	P	J, S
7440-41-7	Beryllium	0.66			P	
7440-43-9	Cadmium	0.05	U	N	P	UL, M
7440-70-2	Calcium	1200		E	P	J, S
7440-47-3	Chromium	14.5			P	
7440-48-4	Cobalt	6.0		E	P	J, S
7440-50-8	Copper	4.0			P	
7439-89-6	Iron	14500		E	P	J, S
7439-92-1	Lead	34.4		N*	P	J, K
7439-95-4	Magnesium	2170		E	P	J, S
7439-96-5	Manganese	528		E	P	↓
7439-97-6	Mercury	0.061			CV	
7440-02-0	Nickel	9.6			P	
7440-09-7	Potassium	966		E	P	J, S
7782-49-2	Selenium	1.0		N	P	L, M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	254			P	L, W
7440-28-0	Thallium	0.58	U	N	P	UL, M
7440-62-2	Vanadium	18.9			P	
7440-66-6	Zinc	120		*E	P	J, S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB18B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-4

Level (low/med): LOW Date Received: 12/3/02

% Solids: 82.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10200			P	
7440-36-0	Antimony	0.44	U	N	P	UL,M
7440-38-2	Arsenic	0.83	B		P	
7440-39-3	Barium	110		E	P	J/S
7440-41-7	Beryllium	0.74			P	
7440-43-9	Cadmium	0.05	U	N	P	UL,M
7440-70-2	Calcium	1470		E	P	J/S
7440-47-3	Chromium	16.6			P	
7440-48-4	Cobalt	8.2		E	P	J/S
7440-50-8	Copper	8.0			P	
7439-89-6	Iron	15300		E	P	J/S
7439-92-1	Lead	6.9		N*	P	J,K
7439-95-4	Magnesium	2620		E	P	J/S
7439-96-5	Manganese	476		E	P	J/S
7439-97-6	Mercury	0.031	B		CV	
7440-02-0	Nickel	10.8			P	
7440-09-7	Potassium	983		E	P	J/S
7782-49-2	Selenium	1.0		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	241			P	L,W
7440-28-0	Thallium	0.61	U	N	P	UL,M
7440-62-2	Vanadium	22.2			P	
7440-66-6	Zinc	49.8		*E	P	J/S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB19A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-5

Level (low/med): LOW Date Received: 12/3/02

% Solids: 81.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11200			P	
7440-36-0	Antimony	0.42	U	N	P	UL,M
7440-38-2	Arsenic	1.0	B		P	
7440-39-3	Barium	142		E	P	J,S
7440-41-7	Beryllium	0.83			P	
7440-43-9	Cadmium	0.05	U	N	P	UL,M
7440-70-2	Calcium	1530		E	P	J,S
7440-47-3	Chromium	17.7			P	
7440-48-4	Cobalt	8.1		E	P	J,S
7440-50-8	Copper	9.9			P	
7439-89-6	Iron	16900		E	P	J,S
7439-92-1	Lead	17.9		N*	P	J,K
7439-95-4	Magnesium	2770		E	P	J,S
7439-96-5	Manganese	546		E	P	↓
7439-97-6	Mercury	0.036	B		CV	
7440-02-0	Nickel	11.6			P	
7440-09-7	Potassium	1110		E	P	J,S
7782-49-2	Selenium	1.1		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	226	B		P	L,W
7440-28-0	Thallium	0.58	U	N	P	UL,M
7440-62-2	Vanadium	25.1			P	
7440-66-6	Zinc	81.6		*E	P	J,S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB19B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-6

Level (low/med): LOW Date Received: 12/3/02

% Solids: 78.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17400			P	
7440-36-0	Antimony	0.44	U	N	P	UL/M
7440-38-2	Arsenic	1.5			P	
7440-39-3	Barium	166		E	P	J/S
7440-41-7	Beryllium	1.1			P	
7440-43-9	Cadmium	0.05	U	N	P	UL/M
7440-70-2	Calcium	1890		E	P	J/S
7440-47-3	Chromium	23.2			P	
7440-48-4	Cobalt	11.4		E	P	J/S
7440-50-8	Copper	20.6			P	
7439-89-6	Iron	22500		E	P	J/S
7439-92-1	Lead	10.3		N*	P	J/K
7439-95-4	Magnesium	3600		E	P	J/S
7439-96-5	Manganese	674		E	P	↓
7439-97-6	Mercury	0.038	B		CV	
7440-02-0	Nickel	16.0			P	
7440-09-7	Potassium	1270		E	P	J/S
7782-49-2	Selenium	1.4		N	P	L/M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	246			P	L/W
7440-28-0	Thallium	0.61	U	N	P	UL/M
7440-62-2	Vanadium	36.2			P	
7440-66-6	Zinc	68.3		*E	P	J/S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB20A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-7

Level (low/med): LOW Date Received: 12/3/02

% Solids: 84.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	8390			P	
7440-36-0	Antimony	0.43	U	N	P	UL/M
7440-38-2	Arsenic	1.1	B		P	
7440-39-3	Barium	119		E	P	J/S
7440-41-7	Beryllium	0.66			P	
7440-43-9	Cadmium	0.05	U	N	P	UL/M
7440-70-2	Calcium	1280		E	P	J/S
7440-47-3	Chromium	14.6			P	
7440-48-4	Cobalt	6.2		E	P	J/S
7440-50-8	Copper	6.3			P	
7439-89-6	Iron	15000		E	P	J/S
7439-92-1	Lead	29.0		N*	P	J/C
7439-95-4	Magnesium	2160		E	P	J/S
7439-96-5	Manganese	502		E	P	↓
7439-97-6	Mercury	0.031	B		CV	
7440-02-0	Nickel	9.3			P	
7440-09-7	Potassium	924		E	P	J/S
7782-49-2	Selenium	0.99		N	P	L/M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	243			P	L/W
7440-28-0	Thallium	0.59	U	N	P	UL/M
7440-62-2	Vanadium	19.8			P	
7440-66-6	Zinc	112		*E	P	J/S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB20B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-8

Level (low/med): LOW Date Received: 12/3/02

% Solids: 83.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	8730			P	
7440-36-0	Antimony	0.43	U	N	P	J,L,M
7440-38-2	Arsenic	0.84	B		P	
7440-39-3	Barium	86.3		E	P	J,S
7440-41-7	Beryllium	0.65			P	
7440-43-9	Cadmium	0.05	U	N	P	U,L,M
7440-70-2	Calcium	1030		E	P	J,S
7440-47-3	Chromium	14.1			P	
7440-48-4	Cobalt	6.4		E	P	J,S
7440-50-8	Copper	7.5			P	
7439-89-6	Iron	13700		E	P	J,S
7439-92-1	Lead	6.3		N*	P	J,E
7439-95-4	Magnesium	2460		E	P	J,S
7439-96-5	Manganese	380		E	P	J
7439-97-6	Mercury	0.026	B		CV	
7440-02-0	Nickel	9.0			P	
7440-09-7	Potassium	910		E	P	J,S
7782-49-2	Selenium	0.86		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	171	B		P	L,W
7440-28-0	Thallium	0.60	U	N	P	J,L,M
7440-62-2	Vanadium	19.5			P	
7440-66-6	Zinc	44.4		*E	P	J,S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB21A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-9

Level (low/med): LOW Date Received: 12/3/02

% Solids: 83.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11400			P	
7440-36-0	Antimony	0.43	U	N	P	DL, M
7440-38-2	Arsenic	0.70	B		P	
7440-39-3	Barium	123		E	P	J/S
7440-41-7	Beryllium	0.73			P	
7440-43-9	Cadmium	0.05	U	N	P	DL, M
7440-70-2	Calcium	21500		E	P	J/S
7440-47-3	Chromium	19.5			P	
7440-48-4	Cobalt	6.8		E	P	J/S
7440-50-8	Copper	5.3			P	
7439-89-6	Iron	13700		E	P	J/S
7439-92-1	Lead	10.6		N*	P	J/L
7439-95-4	Magnesium	3140		E	P	J/S
7439-96-5	Manganese	309		E	P	✓
7439-97-6	Mercury	0.037			CV	
7440-02-0	Nickel	10.8			P	
7440-09-7	Potassium	1170		E	P	J/S
7782-49-2	Selenium	0.54	B	N	P	L, M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	187	B		P	L, W
7440-28-0	Thallium	0.59	U	N	P	DL, M
7440-62-2	Vanadium	23.7			P	
7440-66-6	Zinc	54.9		*E	P	J/S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB21B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-10

Level (low/med): LOW Date Received: 12/3/02

% Solids: 85.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9950			P	
7440-36-0	Antimony	0.43	U	N	P	UL,M
7440-38-2	Arsenic	0.58	B		P	
7440-39-3	Barium	95.1		E	P	J,S
7440-41-7	Beryllium	0.67			P	
7440-43-9	Cadmium	0.05	U	N	P	UL,M
7440-70-2	Calcium	1240		E	P	J,S
7440-47-3	Chromium	15.3			P	
7440-48-4	Cobalt	7.4		E	P	J,S
7440-50-8	Copper	4.6			P	
7439-89-6	Iron	15300		E	P	J,S
7439-92-1	Lead	6.8		N*	P	J,K
7439-95-4	Magnesium	2590		E	P	J,S
7439-96-5	Manganese	405		E	P	↓
7439-97-6	Mercury	0.038	B		CV	
7440-02-0	Nickel	10.3			P	
7440-09-7	Potassium	1130		E	P	J,S
7782-49-2	Selenium	0.78		N	P	J,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	200	B		P	L,W
7440-28-0	Thallium	0.59	U	N	P	UL,M
7440-62-2	Vanadium	24.2			P	
7440-66-6	Zinc	46.5		*E	P	J,S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB22A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-12

Level (low/med): LOW Date Received: 12/4/02

% Solids: 82.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10700			P	
7440-36-0	Antimony	0.43	U	N	P	J,L,M
7440-38-2	Arsenic	1.3			P	
7440-39-3	Barium	147		E	P	J,S
7440-41-7	Beryllium	0.83			P	
7440-43-9	Cadmium	0.05	U	N	P	J,L,M
7440-70-2	Calcium	1700		E	P	J,S
7440-47-3	Chromium	17.6			P	
7440-48-4	Cobalt	7.7		E	P	J,S
7440-50-8	Copper	11.5			P	
7439-89-6	Iron	17800		E	P	J,S
7439-92-1	Lead	33.7		N*	P	J,K
7439-95-4	Magnesium	2540		E	P	J,S
7439-96-5	Manganese	591		E	P	↓
7439-97-6	Mercury	0.042			CV	
7440-02-0	Nickel	11.5			P	
7440-09-7	Potassium	1310		E	P	J,S
7782-49-2	Selenium	1.3		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	250			P	L,W
7440-28-0	Thallium	0.60	U	N	P	J,L,M
7440-62-2	Vanadium	24.5			P	
7440-66-6	Zinc	121		*E	P	J,S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB22B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-13

Level (low/med): LOW Date Received: 12/4/02

% Solids: 81.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14600			P	
7440-36-0	Antimony	0.42	U	N	P	UL,M
7440-38-2	Arsenic	1.4			P	
7440-39-3	Barium	153		E	P	J,S
7440-41-7	Beryllium	1.0			P	
7440-43-9	Cadmium	0.05	U	N	P	UL,M
7440-70-2	Calcium	1860		E	P	J,S
7440-47-3	Chromium	20.5			P	
7440-48-4	Cobalt	9.6		E	P	J,S
7440-50-8	Copper	17.7			P	
7439-89-6	Iron	19900		E	P	J,S
7439-92-1	Lead	9.3		N*	P	J,K
7439-95-4	Magnesium	3220		E	P	J,S
7439-96-5	Manganese	588		E	P	↓
7439-97-6	Mercury	0.038	B		CV	
7440-02-0	Nickel	13.9			P	
7440-09-7	Potassium	1190		E	P	J,S
7782-49-2	Selenium	1.2		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	198	B		P	L,W
7440-28-0	Thallium	0.58	U	N	P	UL,M
7440-62-2	Vanadium	30.5			P	
7440-66-6	Zinc	60.7		*E	P	J,S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB23A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-14

Level (low/med): LOW Date Received: 12/4/02

% Solids: 80.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	19400			P	
7440-36-0	Antimony	0.42	U	N	P	UL,M
7440-38-2	Arsenic	1.9			P	
7440-39-3	Barium	84.9		E	P	J,S
7440-41-7	Beryllium	0.73			P	
7440-43-9	Cadmium	0.05	U	N	P	UL,M
7440-70-2	Calcium	3610		E	P	J,S
7440-47-3	Chromium	26.5			P	
7440-48-4	Cobalt	10.0		E	P	J,S
7440-50-8	Copper	11.7			P	
7439-89-6	Iron	25600		E	P	J,S
7439-92-1	Lead	16.6		N*	P	J,K
7439-95-4	Magnesium	2960		E	P	J,S
7439-96-5	Manganese	429		E	P	↓
7439-97-6	Mercury	0.073			CV	
7440-02-0	Nickel	10.9			P	
7440-09-7	Potassium	1380		E	P	J,S
7782-49-2	Selenium	1.2		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	177	B		P	L,W
7440-28-0	Thallium	0.58	U	N	P	UL,M
7440-62-2	Vanadium	55.3			P	
7440-66-6	Zinc	54.8		*E	P	J,S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB23B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-15

Level (low/med): LOW Date Received: 12/4/02

% Solids: 81.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10400			P	
7440-36-0	Antimony	0.46	U	N	P	UL M
7440-38-2	Arsenic	0.78	B		P	
7440-39-3	Barium	112		E	P	J/S
7440-41-7	Beryllium	0.73			P	
7440-43-9	Cadmium	0.05	U	N	P	UL M
7440-70-2	Calcium	1180		E	P	J/S
7440-47-3	Chromium	16.8			P	
7440-48-4	Cobalt	7.6		E	P	J/S
7440-50-8	Copper	6.7			P	
7439-89-6	Iron	15700		E	P	J/S
7439-92-1	Lead	8.6		N*	P	J/K
7439-95-4	Magnesium	2770		E	P	J/S
7439-96-5	Manganese	431		E	P	↓
7439-97-6	Mercury	0.039	B		CV	
7440-02-0	Nickel	10.7			P	
7440-09-7	Potassium	1050		E	P	J/S
7782-49-2	Selenium	1.1		N	P	L/M
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	180	B		P	L/W
7440-28-0	Thallium	0.63	U	N	P	UL M
7440-62-2	Vanadium	23.4			P	
7440-66-6	Zinc	51.5		*E	P	J/S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB24A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-16

Level (low/med): LOW Date Received: 12/4/02

% Solids: 85.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15600			P	
7440-36-0	Antimony	0.40	U	N	P	UL; M
7440-38-2	Arsenic	1.5			P	
7440-39-3	Barium	126		E	P	J-S
7440-41-7	Beryllium	0.81			P	
7440-43-9	Cadmium	0.04	U	N	P	UL; M
7440-70-2	Calcium	6070		E	P	J-S
7440-47-3	Chromium	21.4			P	
7440-48-4	Cobalt	9.0		E	P	J-S
7440-50-8	Copper	9.6			P	
7439-89-6	Iron	21300		E	P	J-S
7439-92-1	Lead	21.6		N*	P	J-K
7439-95-4	Magnesium	4490		E	P	J-S
7439-96-5	Manganese	493		E	P	J-S
7439-97-6	Mercury	0.047			CV	
7440-02-0	Nickel	11.9			P	
7440-09-7	Potassium	1460		E	P	J-S
7782-49-2	Selenium	1.3		N	P	L-M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	201	B		P	L-W
7440-28-0	Thallium	0.55	U	N	P	UL-M
7440-62-2	Vanadium	39.9			P	
7440-66-6	Zinc	71.2		*E	P	J-S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB24B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-17

Level (low/med): LOW Date Received: 12/4/02

% Solids: 79.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12800			P	
7440-36-0	Antimony	0.44	U	N	P	UL,M
7440-38-2	Arsenic	1.0	B		P	
7440-39-3	Barium	161		E	P	J/S
7440-41-7	Beryllium	0.90			P	
7440-43-9	Cadmium	0.05	U	N	P	UL,M
7440-70-2	Calcium	1730		E	P	J/S
7440-47-3	Chromium	19.6			P	
7440-48-4	Cobalt	9.0		E	P	J/S
7440-50-8	Copper	12.4			P	
7439-89-6	Iron	17900		E	P	J/S
7439-92-1	Lead	9.5		N*	P	J/S
7439-95-4	Magnesium	3040		E	P	J/S
7439-96-5	Manganese	587		E	P	↓
7439-97-6	Mercury	0.038	B		CV	
7440-02-0	Nickel	13.0			P	
7440-09-7	Potassium	1200		E	P	J/S
7782-49-2	Selenium	1.2		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	199	B		P	L,W
7440-28-0	Thallium	0.61	U	N	P	UL,M
7440-62-2	Vanadium	27.5			P	
7440-66-6	Zinc	62.3		*E	P	J/S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB26A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-18

Level (low/med): LOW Date Received: 12/4/02

% Solids: 86.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7270			P	
7440-36-0	Antimony	0.42	U	N	P	UL,M
7440-38-2	Arsenic	1.1			P	
7440-39-3	Barium	117		E	P	J,S
7440-41-7	Beryllium	0.62			P	
7440-43-9	Cadmium	0.05	U	N	P	UL,M
7440-70-2	Calcium	1020		E	P	J,S
7440-47-3	Chromium	13.8			P	
7440-48-4	Cobalt	5.8		E	P	J,S
7440-50-8	Copper	3.9			P	
7439-89-6	Iron	16200		E	P	J,S
7439-92-1	Lead	57.0		N*	P	J,F
7439-95-4	Magnesium	1880		E	P	J,S
7439-96-5	Manganese	598		E	P	↓
7439-97-6	Mercury	0.036			CV	
7440-02-0	Nickel	8.4			P	
7440-09-7	Potassium	939		E	P	J,S
7782-49-2	Selenium	1.1		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	312			P	L,W
7440-28-0	Thallium	0.58	U	N	P	UL,M
7440-62-2	Vanadium	18.2			P	
7440-66-6	Zinc	191		*E	P	J,S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB26B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-19

Level (low/med): LOW Date Received: 12/4/02

% Solids: 83.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11900			P	
7440-36-0	Antimony	0.43	U	N	P	UL,M
7440-38-2	Arsenic	1.0	B		P	
7440-39-3	Barium	125		E	P	J,S
7440-41-7	Beryllium	0.85			P	
7440-43-9	Cadmium	0.05	U	N	P	UL,M
7440-70-2	Calcium	1040		E	P	J,S
7440-47-3	Chromium	17.9			P	
7440-48-4	Cobalt	7.5		E	P	J,S
7440-50-8	Copper	12.4			P	
7439-89-6	Iron	16800		E	P	J,S
7439-92-1	Lead	7.8		N*	P	J,L
7439-95-4	Magnesium	2900		E	P	J,S
7439-96-5	Manganese	484		E	P	↓
7439-97-6	Mercury	0.029	B		CV	
7440-02-0	Nickel	12.5			P	
7440-09-7	Potassium	1100		E	P	J,S
7782-49-2	Selenium	1.2		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	180	B		P	L,W
7440-28-0	Thallium	0.59	U	N	P	UL,M
7440-62-2	Vanadium	24.4			P	
7440-66-6	Zinc	56.8		*E	P	J,S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-10

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-11

Level (low/med): LOW Date Received: 12/3/02

% Solids: 82.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11400			P	
7440-36-0	Antimony	0.43	U	N	P	J,L,M
7440-38-2	Arsenic	1.2			P	
7440-39-3	Barium	106		E	P	J,S
7440-41-7	Beryllium	0.75			P	
7440-43-9	Cadmium	0.05	U	N	P	J,L,M
7440-70-2	Calcium	1350		E	P	J,S
7440-47-3	Chromium	16.7			P	
7440-48-4	Cobalt	7.9		E	P	J,S
7440-50-8	Copper	9.9			P	
7439-89-6	Iron	16800		E	P	J,S
7439-92-1	Lead	7.5		N*	P	J,K
7439-95-4	Magnesium	2750		E	P	J,S
7439-96-5	Manganese	450		E	P	↓
7439-97-6	Mercury	0.036	B		CV	
7440-02-0	Nickel	11.4			P	
7440-09-7	Potassium	1140		E	P	J,S
7782-49-2	Selenium	1.0		N	P	J,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	171	B		P	J,W
7440-28-0	Thallium	0.59	U	N	P	J,L,M
7440-62-2	Vanadium	26.1			P	
7440-66-6	Zinc	51.2		*E	P	J,S

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-7

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: Q2810

Matrix (soil/water): SOIL Lab Sample ID: Q2810-20

Level (low/med): LOW Date Received: 12/4/02

% Solids: 83.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11500			P	
7440-36-0	Antimony	0.42	U	N	P	UL, M
7440-38-2	Arsenic	1.1	B		P	
7440-39-3	Barium	125		E	P	J, S
7440-41-7	Beryllium	0.87			P	
7440-43-9	Cadmium	0.05	U	N	P	UL, M
7440-70-2	Calcium	1110		E	P	J, S
7440-47-3	Chromium	17.4			P	
7440-48-4	Cobalt	8.2		E	P	J, S
7440-50-8	Copper	11.0			P	
7439-89-6	Iron	16600		E	P	J, S
7439-92-1	Lead	7.8		N*	P	J, K
7439-95-4	Magnesium	2980		E	P	J, S
7439-96-5	Manganese	554		E	P	J
7439-97-6	Mercury	0.039			CV	
7440-02-0	Nickel	12.4			P	
7440-09-7	Potassium	1080		E	P	J, S
7782-49-2	Selenium	0.97		N	P	L, M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	197	B		P	LW
7440-28-0	Thallium	0.58	U	N	P	UL, M
7440-62-2	Vanadium	24.4			P	
7440-66-6	Zinc	57.1		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 2/24/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: Q2810
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

Collect	Extract	Analyzed
12/2/02	12/4/02	12/11/02 J 12/12/02
12/3/02	12/8/02	12/14/02 J 12/13/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes: MB extract 12/9/02 bis(2-ethyl---) 35 ug/kg 10x → B/E
" " 12/14/02 ——— fluoranthene 27 ug/kg <5x B/E

EQB-11 in R2510 bis(2-ethyl at 10 ug/L flag sec. in narr. due to MB.

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes: see attached
atrazine ND → R/C in all samples

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery						Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?					✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?					✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?							✓
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.							
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)							✓
		1 or more <10%	2 or 3 high/low	2 or 3 all low	2 or 3 all high			
	Positives	L	J	L	K			
	Non-detects	R	UJ	UL	NONE			
	Note: The B qualifier remains over surrogate flagging.							

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 4-nitroaniline (MS) 110 > 16-106 (MSD) 120% > QC
see attached
No det. in parent 545523B, no action

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: 3-nitroaniline 118 > 11-105
4-nitroaniline 121 > 10-113 No det, no flag

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 545B21B and D-10 | 545B26B and D-7

bis(2-ethylhexyl) 95 RL=400 55 ok ✓ | are ND | Bis(2-ethylhexyl) 43 B, Z ok ✓

Phf-

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively identified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".	✓		

Notes:

TIC → NJ, ✓

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 20			
12.1.2	Number of target compounds in each analysis: 65			
12.1.3	Number of results rejected and not reported: 17			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 98%			

Notes:

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA [redacted]
Date: 3/19/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: G2910
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids			
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes: Collected 12/2/02 — Extracted 12/9/02 — Analyzed 12/5/02, 12/8/02, 12/13/02 — 12/16/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: EQB-10, EQB-11 in R2510 both NDs ✓

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 2-4-6-trinitrotoluene MS: 20% OL
1,3,5-trinitrobenzene, 2,4,6-TNT, 4-Nitrotoluene RPD 2QC.
Pos. QC

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes: 1,3,5-TNB 4% LCSC
Nitrobenzene 4% LCSC acting as BLS

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 2,4,6-TNB Conc. Low
acting as MS acting as MSD
D.C. Conc. Close to LCSD
acting as

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		✓	
10.1.1	Number of samples: 22			
10.1.3	Number of results rejected and not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness = 36%			

Notes:

14

280 − 40 = 240

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: AJ
Date: 02/05/03
DV Level: II III IV

Review Document:

_X_ Region III Modified for National Functional Guidelines
___ NFG for organic Data review (February 1994)
___ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: Q2810
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: COC ID'S: 1032, 1091

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: cooler temps 3.0°C, 2.0°C

sampled 12/02/02, 12/03/02
extracted 12/09/02
analysis 12/19/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: No field/equipment blanks in this package. ✓ in R2§10 of DV

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).	X		
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? 50-150%	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits? 68, 79		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits? 15		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS/MSD on sample 545B36

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits? 94		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: No LCSD

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.	X		

Notes: D-7 = 545B26B All results ND
D-10 = 545B21B

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RH
Date: 2/18/03
DV Level: II (III) IV
Review Document:

_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: Q2810
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes: Collected 12/12/02. Extracted 12/16/02. Analyzed 12/19/02.

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: See attached [illegible]

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			✓
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			✓
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		✓	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: 545B21A [illegible] at QC limit 50-150 OK/
545B24B [illegible]

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: [illegible] unless prev. flagged

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?			
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?			
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			
	Action: If Yes, J(+) only.			

Notes: See attached J/R, L

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

D-10	and	545B21B		D-7	and	545B26B	
Pyrene	14	20 U	OK	Pyrene	10	9.4	OK

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.			

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?			

Notes:

flouranthene "E" 545B20 B No dilution since originally reported lower result ✓

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)			
10.1.1	Number of samples:			
10.1.3	Number of results rejected and not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness =			

Notes:

16

46

42

274

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: G2810
Project No.: 15291524.00000

Project Name: Radford SWMU 54
Reviewer: RA
Date: 2/20/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{O}C \pm 2\ ^{O}C$)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes, % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: collect 12/23/02 analyzed 12/11/02 Hg
12/11/12/02 ICP

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%?		✓				
	<50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						

Note:

Cd 116 ND no flag
Cr 84.4) 72XCRDL
Mn 69)
Na 78 LW

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?		✓			✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L						
4.5	Are there reported field blankor trip blank values > ± MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						

EQB-10 in R2510
Cr .77
Na 253
all 75X no flags

Note: MB Ba .043 all 5X no flag
Mg 6.681
K 12.809
Zn .181
ICB, CCB also low Ba, beryllium, Ca, iron, Mg
Mn, K, Zn all 75X, no flags

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.		✓		✓		

Note: lead 44.3% → J,K

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓		
	%R > 125% / 30%< %R < 74% / < 30% Positive: K / L / L Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	✓					✓

Note: antimony 31.9 / 32.2 L Se 69%. L / UL / NA
Cd 74.1% UL
lead 159.2 / 135.1 Tl 59.5 / 61.7

9.0 Instrument Detection Limits (IDL)

(Val. JLL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?						

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note:

Ba 11.2
Ca 14.2
Fe [redacted] 13
Mg 13.8
Mn 12.7
K 17.8
Zn 17.4

P05 JLS

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		✓		✓		

CN 7 QC for D10/545B21B

Note:

545B26B and D-7			RPD
Al	11900	11500	3% ✓
As	1	1.1 OKV	
Ba	125	125	0%
Be	.85	.87 OK	
Ca	1040	1110	6%
Cr	17.9	17.4 OK	

545B26B	D-7	RPD
Co	7.5	8.20KV
Cu	12.4	11.0KV
Fe	16800	16600 1.1%
Pb	7.8	7.8 0%
Mg	2980	2980 3%
Mn	484	554 13% ✓
Hg	.029	.030K
Ni	12.5	12.40K

K	1100	1080	2% RPD
Se	1.2	.970K	
Na	180	197	9% ✓
V	24.4	24.4	0%
Zn	56.8	57.1	.5%

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓		
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note: _____

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples: _____						
13.1.2	Number of target compounds in each analysis: _____						
13.1.3	Number of results rejected and not reported: _____						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)						
	% Completeness = _____						

Note: _____

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1032

063

Project Number	Project Name
97604-310	RFAAP

Project Contact (Name and Phone Number): Darren Rennie

Samplers: Fisher / Spangler

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B17A	12/2/02 1015	S		X	S	E		2		X	X			X		X							Explosives including Nitro Glycerin
545B17B	12/2/02 1030	S		X	S	E		2		X	X			X		X							
545B18A	12/2/02 1045	S		X	S	E		2		X	X			X		X							
545B18B	12/2/02 1100	S		X	S	E		2		X	X			X	X								
545B19A	12/2/02 1110	S		X	S	E		2		X	X			X		X							
545B19B	12/2/02 1120	S		X	S	E		2		X	X			X		X							
545B20A	12/2/02 1515	S		X	S	E		2		X	X			X		X							
545B20B	12/2/02 1525	S		X	S	E		2		X	X			X		X							
545B21A	12/2/02 1535	S		X	S	E		2		X	X			X		X							
545B21B	12/2/02 1545	S		X	S	E		2		X	X			X		X							
D-10	12/2/02	S		X	S	E		2		X	X			X		X							
EQB-10	12/2/02 1630	S		X	S	E		4		X	X			X		X							

LAB:

AIRBILL No:

Courier:

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature] 12/2/02	1800				
Relinquished by:	Date/time	Received by: (for lab) Procure T. Bailey	Date/Time 12-3-02 9:00 am	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

30°C

Radford Army Ammunition Plant
Chain Of Custody Record

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Darren Renga

Samplers: Fisher / Spangler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B22A	12/3/02 845	5		X	5	E		2		X	X			X		X							Explosives Including
545B22B	12/3/02 855	5		X	5	E		2		X	X			X		X							Nitro Glycerin
545B23A	12/3/02 900	5		X	5	E		2		X	X			X		X							
545B23B	12/3/02 910	5		X	5	E		2		X	X			X		X							
545B23BMS	12/3/02 910	5		X	5	E		2		X	X			X		X							
545B23BMSD	12/3/02 910	5		X	5	E		2		X	X			X		X							
545B24A	12/3/02 925	5		X	5	E		2		X	X			X		X							
545B24B	12/3/02 935	5		X	5	E		2		X	X			X		X							
545B25A	12/3/02 950	5		X	5	E		3		X	X	X	X	X		X							
545B25B	12/3/02 1000	5		X	5	E		3		X	X	X	X	X		X							
545B26A	12/3/02 1010	5		X	5	E		2		X	X			X		X							
545B26B	12/3/02 1020	5		X	5	E		2		X	X			X		X							
D-7	12/3/02	5		X	5	E		2		X	X			X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO_3 + Ice
C. NaOH + Ice
D. H_2SO_4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. $NaHSO_4$ + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	12/5/02 1500				
Relinquished by:	Date/time	Received by: (for lab) Vincent T. Bailey	Date/Time 12/4/02 9:00am	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp: 2.0°C

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: _____R2810_____ **Fraction:_SVOCs, Pest., PCBs, PAH, Explosives, Nitroglycerin, Metals**

Lab: _CompuChem_____ **Project Name: __Radford SWMU 54_____**

Reviewer: _____RA, AJ_____ **Date: _____March 7, 2003_____**

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the SVOC analyses, the continuing calibrations analyzed on 12/10/02, 12/13/02, and 12/15/02 displayed %Ds greater than the QC limit (i.e., 20%) with a negative bias for atrazine at 67.66%, 53.45%, and 70.48%, respectively. All associated sample results were non-detect and were flagged "R,c." The LCS recoveries for 2-methylphenol (35%) and 2,4-dimethylphenol (6%) were less than the lower QC limit. All associated sample results were non-detect and were flagged "R,l."

For the explosive analyses, the LCS recoveries for 1,3,5-trinitrobenzene (48%) and RDX (48%) were less than the lower QC limit (i.e., 50%) for the LCS extracted on 12/10/02. The LCS recoveries were less than the lower QC limit for all compounds for the LCS extracted on 12/13/02. All associated sample results were non-detect and were flagged "R,l." The percent completeness was less than the QC limit (i.e., 90%) at 51% due to this anomaly.

Minor Anomalies: For the SVOC analyses, the initial calibration analyzed on 11/25/02 displayed RSDs greater than the control limit (i.e., 15%) for benzaldehyde at 18.8%, 2,4-dimethylphenol at 17.4%, hexachlorocyclopentadiene at 17.6%, n-nitrosodiphenylamine at 15.8%, and atrazine at 69.7%. All associated sample results were non-detects and the only failure that was serious enough (i.e., >50%) to affect the non-detects was for atrazine. Atrazine non-detects were previously flagged "R,c" in the associated samples. No further data qualifying action was required.

The CCV analyzed on 12/10/02 at 2245 displayed %Ds greater than the control limit (i.e., 20%) with a negative bias for 2,4-dimethylphenol at 22.97%, caprolactam at 20.89%, and 2-methylnaphthalene at 25.4% and with a positive bias for 2-chloronaphthalene at 21.47%, acenaphthylene at 29.45%, and 2,4-

dinitrophenol at 22.84%. The CCV analyzed on 12/13/02 at 2150 displayed %Ds greater than the control limit with a positive bias for 1,1-biphenyl at 20.66% and with a negative bias for hexachlorocyclopentadiene at 27.48%. The CCV analyzed on 12/15/02 at 1121 displayed %Ds greater than the control limit control limit with a positive bias for bis(2-chloroethoxy)methane at 24.54%, dimethylphthalate at 23.07%, 3-nitroaniline at 50.08%, diethylphthalate at 34.04%, and 4-nitroaniline at 27.16%. Non-detects were flagged "UJ,c" for the failures associated with negative biases unless previously flagged due to other anomalies. No positive results were reported for the failures associated with positive biases and no data qualifying action was required.

The LCS recoveries for acenaphthene (106%), 3-nitroaniline (109%/108%), acenaphthylene (107%), dibenzofuran (112%), diethylphthalate (104%), 4-nitroaniline (120%), benzo(k)fluoranthene (112%), and indeno(1,2,3-cd)pyrene (111%) were greater than the upper QC limit. No positive results were reported for these compounds and no data qualifying action was required.

For the pesticides analyses, the CCV analyzed on 12/11/02 at 1824 displayed a %D greater than the control limit (i.e., 15%) with a negative bias for 4,4-DDT at 16.27%. The CCV analyzed on 12/11/02 at 1855 displayed a %D greater than the control limit with a negative bias for 4,4-DDT at 16.27%. The CCV analyzed on 12/11/02 at 1926 displayed %Ds greater than the control limit with a negative bias for 4,4-DDT at 16.27% and methoxychlor at 15.54%. All associated sample results were non-detects and no data qualifying action was required since the %Ds were acceptable on the alternate column.

The LCS recoveries were greater than the upper QC limit for 4,4-DDT at 190%, endosulfan I at 390%, and 4,4-DDD at 170%. All associated sample results were non-detects and no data qualifying action was required.

For the PAH analyses, the CCV analyzed on 12/19/02 at 0701 displayed a %D greater than the control limit (i.e., 15%) with a negative bias for pyrene at 16.23%. The CCV analyzed on 12/19/02 at 1315 displayed a %D greater than the control limit with a negative bias for pyrene at 16.23%. The CCV analyzed on 12/20/02 at 1422 displayed a %D greater than the control limit with a negative bias for pyrene at 15.88%. All associated sample results were non-detects and no data qualifying action was required since the %Ds were acceptable on the alternate column.

For the explosives analyses, the continuing calibration analyzed on 12/14/02 at 2057 displayed a %D greater than the QC limit (i.e., 15%) with a positive bias for 2,4,6-trinitrotoluene at 19%. The continuing calibration analyzed on 12/20/02 at 1954 displayed a %Ds greater than the QC limit with a positive bias for HMX at 27.89%. All associated sample results were non-detects and no data qualifying

action was required. The continuing calibration analyzed on 12/15/02 at 1408 displayed a %D greater than the QC limit with a negative bias for tetryl at 28.34%. All associated sample results were non-detect and were flagged "UJ,c."

The recovery for surrogate 1,4-dinitrobenzene in sample EQB-14 (140%) was greater than the upper QC limit. All associated sample results were non-detects and no data qualifying action was required.

For the metal analyses, the initial CRDL percent recoveries for aluminum (111.1%), lead (137.7%), selenium (114%), sodium (78%), and thallium (113.4%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "L,w" for sodium and "K,w" for selenium. No positive results were reported for aluminum, lead, and thallium and no data qualifying action was required.

The method blank contained barium at 0.367 ug/L, magnesium at 60.76 ug/L and mercury at 0.107 ug/L. Positive results less than 5 times the blank concentration were flagged "B,p" in the associated samples.

The initial and continuing calibration blanks also contained positive results for barium, magnesium, beryllium, calcium, manganese, and zinc and negative results for calcium and silver. Positive results less than 5 times the blank concentration were flagged "B,o" in the associated samples. Non-detects were flagged "UL,o" for calcium and silver in the associated samples.

Correctable Anomalies: Equipment blank EQB-11 was reported as EQB-10 on the chain of custody. The laboratory corrected the COC to EQB-11.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were raised.

It should be noted that if a given fraction (analysis) is not discussed in this report, it indicates that no anomalies were observed for that fraction. Except for data flagged "R", all data, as qualified, are usable for their intended purpose based on the data reviewed.

Signed: Ranjan

SAMPLENUM	CLIENTID	QUOTENUMREF	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
R2810-1	EQB-10	Q2810	R2810	WA	URS	RADFORD SWMU 54	12/3/02
R2810-2	EQB-11	Q2810	R2810	WA	URS	RADFORD SWMU 54	12/4/02
R2810-3	EQB-12	Q2810	R2810	WA	URS	RADFORD SWMU 54	12/6/02
R2810-4	EQB-13	Q2810	R2810	WA	URS	RADFORD SWMU 54	12/10/02
R2810-5	EQB-14	Q2810	R2810	WA	URS	RADFORD SWMU 54	12/11/02

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-10

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-1B64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/07/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U R1 R
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U R1 R
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U W,C
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-10

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-1B64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/07/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U RIC
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-10

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-1B64

Level: (low/med) LOW Date Received: 12/03/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/07/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-11

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-2

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-2B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/07/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U R,L
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U R,L
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U W,C
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-11

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-2

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-2B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/07/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U RIC
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-11

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-2

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-2B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/07/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-12

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-3B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U R,Q
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U R,Q
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U UJ,C
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U UJ,C
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-12

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-3B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U R,C
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-12

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-3B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/11/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
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27.					
28.					
29.					
30.					

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-13

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-4A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/12/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U R, X
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U R, X
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-13

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-4A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/12/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U R,C
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-13

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-4A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/12/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	16.50	7	J
2.		UNKNOWN	16.74	7	J
3.		UNKNOWN CARBOXYLIC ACID	21.52	32	J
4.		UNKNOWN	21.64	19	J
5.		UNKNOWN	22.23	160	J
6.		UNKNOWN CARBOXYLIC ACID	23.94	24	J
7.		UNKNOWN	24.49	45	J
8.					
9.					
10.					
11.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-14

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-5

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-5A64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/12/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-52-7	Benzaldehyde	10	U
108-95-2	Phenol	10	U
111-44-4	Bis(2-chloroethyl)ether	10	U
95-57-8	2-Chlorophenol	10	U
95-48-7	2-Methylphenol	10	U R, Q
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
98-86-2	Acetophenone	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-N-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U R, Q
111-91-1	Bis(2-chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
105-60-2	Caprolactam	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	10	U
92-52-4	1,1'-Biphenyl	10	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EQB-14

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-5

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-5A64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/12/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
132-64-9	Dibenzofuran	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
1912-24-9	Atrazine	10	U R,C
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
117-81-7	bis(2-ethylhexyl)Phthalate	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

EQB-14

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-5

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R2810-5A64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: _____ decanted: (Y/N)___ Date Extracted:12/12/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN	22.35	10	J
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
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26.					
27.					
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29.					
30.					

FORM I SV-TIC

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-11

Lab Name: COMPUCHEM Contract: 8081A-8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-2

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:12/09/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.40	U
72-55-9	4,4'-DDE	0.20	U
50-29-3	4,4'-DDT	0.60	U
60-57-1	Dieldrin	0.20	U
959-98-8	Endosulfan I	0.20	U
33213-65-9	Endosulfan II	0.40	U
1031-07-8	Endosulfan sulfate	0.40	U
72-20-8	Endrin	0.40	U
7421-93-4	Endrin Aldehyde	0.40	U
76-44-8	Heptachlor	0.10	U
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.20	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-12

Lab Name: COMPUCHEM Contract: 8081A-8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:12/09/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/11/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.40	U
72-55-9	4,4'-DDE	0.20	U
50-29-3	4,4'-DDT	0.60	U
60-57-1	Dieldrin	0.20	U
959-98-8	Endosulfan I	0.20	U
33213-65-9	Endosulfan II	0.40	U
1031-07-8	Endosulfan sulfate	0.40	U
72-20-8	Endrin	0.40	U
7421-93-4	Endrin Aldehyde	0.40	U
76-44-8	Heptachlor	0.10	U
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.20	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-13

Lab Name: COMPUCHEM Contract: 8081A-8082

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-4

Sample wt/vol: 500.0 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:12/13/02

Concentrated Extract Volume: 2500(uL) Date Analyzed: 12/14/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0 Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
309-00-2	Aldrin	0.10	U
319-84-6	alpha-BHC	0.10	U
319-85-7	beta-BHC	0.10	U
319-86-8	delta-BHC	0.10	U
58-89-9	gamma-BHC (Lindane)	0.10	U
72-54-8	4,4'-DDD	0.40	U
72-55-9	4,4'-DDE	0.20	U
50-29-3	4,4'-DDT	0.60	U
60-57-1	Dieldrin	0.20	U
959-98-8	Endosulfan I	0.20	U
33213-65-9	Endosulfan II	0.40	U
1031-07-8	Endosulfan sulfate	0.40	U
72-20-8	Endrin	0.40	U
7421-93-4	Endrin Aldehyde	0.40	U
76-44-8	Heptachlor	0.10	U
1024-57-3	Heptachlor Epoxide	0.10	U
72-43-5	Methoxychlor	1.0	U
8001-35-2	Toxaphene	10	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U
53494-70-5	Endrin Ketone	1.0	U
5103-74-2	gamma-Chlordane	0.10	U
5103-71-9	alpha-Chlordane	0.20	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-10

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-1

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 17000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	6.8	U
99-35-4	1,3,5-Trinitrobenzene	5.1	U R,Q
121-82-4	RDX	5.1	U R,Q
99-65-0	1,3-Dinitrobenzene	5.1	U
118-96-7	2,4,6-Trinitrotoluene	5.1	U
479-45-8	Tetryl	6.8	U J,C
98-95-3	Nitrobenzene	5.1	U
121-14-2	2,4-Dinitrotoluene	5.1	U
606-20-2	2,6-Dinitrotoluene	6.8	U
35572-78-2	2-Amino-4,6-dinitrotoluene	6.8	U
1946-51-0	4-Amino-2,6-dinitrotoluene	6.8	U
88-72-2	2-Nitrotoluene	5.1	U
99-99-0	4-Nitrotoluene	5.1	U
99-08-1	3-Nitrotoluene	5.1	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-11

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-2

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 28000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	11	U
99-35-4	1,3,5-Trinitrobenzene	8.4	U R,Q
121-82-4	RDX	8.4	U ↙
99-65-0	1,3-Dinitrobenzene	8.4	U
118-96-7	2,4,6-Trinitrotoluene	8.4	U
479-45-8	Tetryl	11	U UJ,C
98-95-3	Nitrobenzene	8.4	U
121-14-2	2,4-Dinitrotoluene	8.4	U
606-20-2	2,6-Dinitrotoluene	11	U
35572-78-2	2-Amino-4,6-dinitrotoluene	11	U
1946-51-0	4-Amino-2,6-dinitrotoluene	11	U
88-72-2	2-Nitrotoluene	8.4	U
99-99-0	4-Nitrotoluene	8.4	U
99-08-1	3-Nitrotoluene	8.4	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-12

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-3

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 20000(ul) Date Analyzed: 12/15/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	8.0	U
99-35-4	1,3,5-Trinitrobenzene	6.0	U
121-82-4	RDX	6.0	U
99-65-0	1,3-Dinitrobenzene	6.0	U
118-96-7	2,4,6-Trinitrotoluene	6.0	U
479-45-8	Tetryl	8.0	U UJ, C
98-95-3	Nitrobenzene	6.0	U
121-14-2	2,4-Dinitrotoluene	6.0	U
606-20-2	2,6-Dinitrotoluene	8.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	8.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	8.0	U
88-72-2	2-Nitrotoluene	6.0	U
99-99-0	4-Nitrotoluene	6.0	U
99-08-1	3-Nitrotoluene	6.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-13

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-4

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/13/02

Concentrated Extract Volume: 11000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	4.4	U
99-35-4	1,3,5-Trinitrobenzene	3.3	U
121-82-4	RDX	3.3	U
99-65-0	1,3-Dinitrobenzene	3.3	U
118-96-7	2,4,6-Trinitrotoluene	3.3	U
479-45-8	Tetryl	4.4	U
98-95-3	Nitrobenzene	3.3	U
121-14-2	2,4-Dinitrotoluene	3.3	U
606-20-2	2,6-Dinitrotoluene	4.4	U
35572-78-2	2-Amino-4,6-dinitrotoluene	4.4	U
1946-51-0	4-Amino-2,6-dinitrotoluene	4.4	U
88-72-2	2-Nitrotoluene	3.3	U
99-99-0	4-Nitrotoluene	3.3	U
99-08-1	3-Nitrotoluene	3.3	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-14

Lab Name: COMPUCHEM Contract: 8330

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-5

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/13/02

Concentrated Extract Volume: 14000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	5.6	U
99-35-4	1,3,5-Trinitrobenzene	4.2	U
121-82-4	RDX	4.2	U
99-65-0	1,3-Dinitrobenzene	4.2	U
118-96-7	2,4,6-Trinitrotoluene	4.2	U
479-45-8	Tetryl	5.6	U
98-95-3	Nitrobenzene	4.2	U
121-14-2	2,4-Dinitrotoluene	4.2	U
606-20-2	2,6-Dinitrotoluene	5.6	U
35572-78-2	2-Amino-4,6-dinitrotoluene	5.6	U
1946-51-0	4-Amino-2,6-dinitrotoluene	5.6	U
88-72-2	2-Nitrotoluene	4.2	U
99-99-0	4-Nitrotoluene	4.2	U
99-08-1	3-Nitrotoluene	4.2	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-10

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) ___ Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 12/07/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
90-12-0	1-Methylnaphthalene	1.2	U
91-57-6	2-Methylnaphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-11

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-2

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) ___ Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 12/07/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
90-12-0	1-Methylnaphthalene	1.2	U
91-57-6	2-Methylnaphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-12

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-3

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:12/10/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
90-12-0	1-Methylnaphtnalene	1.2	U
91-57-6	2-Methylnaphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-13

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-4

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
90-12-0	1-Methylnaphthalene	1.2	U
91-57-6	2-Methylnaphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-14

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-5

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N) ___ Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SEPF Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	1.2	U
90-12-0	1-Methylnaphthalene	1.2	U
91-57-6	2-Methylnaphthalene	1.2	U
83-32-9	Acenaphthene	1.2	U
86-73-7	Fluorene	1.2	U
129-00-0	Pyrene	0.50	U
85-01-8	Phenanthrene	1.2	U
120-12-7	Anthracene	1.2	U
206-44-0	Fluoranthene	0.50	U
218-01-9	Chrysene	0.25	U
205-99-2	Benzo(b)fluoranthene	0.25	U
207-08-9	Benzo(k)fluoranthene	0.25	U
53-70-3	Dibenzo(a,h)anthracene	0.25	U
191-24-2	Benzo(g,h,i)perylene	0.25	U
56-55-3	Benzo(a)anthracene	0.25	U
50-32-8	Benzo(a)pyrene	0.25	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.25	U
208-96-8	Acenaphthylene	1.2	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-10

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-1

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/03/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 17000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	100	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-11

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-2

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 28000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	170	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-12

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-3

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/09/02

Concentrated Extract Volume: 20000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	120	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-13

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-4

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/13/02

Concentrated Extract Volume: 11000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	66	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQB-14

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: R2810

Matrix: (soil/water) WATER Lab Sample ID: R2810-5

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/13/02

Concentrated Extract Volume: 14000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	84	U

FORM I PEST

SW846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EQB-10

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix (soil/water): WATER Lab Sample ID: R2810-1

Level (low/med): LOW Date Received: 12/3/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21.8	U		P	
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	2.5	U		P	
7440-39-3	Barium	0.91	B		P	B, P
7440-41-7	Beryllium	0.10	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	9.6	U		P	UL, O
7440-47-3	Chromium	0.77	B		P	
7440-48-4	Cobalt	0.60	U		P	
7440-50-8	Copper	1.4	U		P	
7439-89-6	Iron	13.7	U		P	
7439-92-1	Lead	2.3	U		P	
7439-95-4	Magnesium	61.2	B		P	B, P
7439-96-5	Manganese	0.20	U		P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	118	U		P	
7782-49-2	Selenium	3.3	U		P	
7440-22-4	Silver	0.70	U		P	SL, O
7440-23-5	Sodium	253	B		P	L, W
7440-28-0	Thallium	5.1	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.1	B		P	B, O

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
EQB-11

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix (soil/water): WATER Lab Sample ID: R2810-2

Level (low/med): LOW Date Received: 12/4/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21.8	U		P	
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	2.5	U		P	
7440-39-3	Barium	0.40	B		P	B,P
7440-41-7	Beryllium	0.10	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	21.8	B		P	B,O
7440-47-3	Chromium	0.60	U		P	
7440-48-4	Cobalt	0.60	U		P	
7440-50-8	Copper	1.4	U		P	
7439-89-6	Iron	13.7	U		P	
7439-92-1	Lead	2.3	U		P	
7439-95-4	Magnesium	59.8	B		P	B,P
7439-96-5	Manganese	0.42	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	118	U		P	
7782-49-2	Selenium	3.4	B		P	K,W
7440-22-4	Silver	0.70	U		P	SL,O
7440-23-5	Sodium	249	U		P	
7440-28-0	Thallium	5.1	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	2.3	B		P	B,O

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
EQB-12

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix (soil/water): WATER Lab Sample ID: R2810-3

Level (low/med): LOW Date Received: 12/6/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21.8	U		P	
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	2.5	U		P	
7440-39-3	Barium	0.33	B		P	B,P
7440-41-7	Beryllium	0.10	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	14.0	B		P	B,O
7440-47-3	Chromium	0.67	B		P	
7440-48-4	Cobalt	0.60	U		P	
7440-50-8	Copper	1.4	U		P	
7439-89-6	Iron	13.7	U		P	
7439-92-1	Lead	2.3	U		P	
7439-95-4	Magnesium	62.2	B		P	B,P
7439-96-5	Manganese	0.33	B		P	B,O
7439-97-6	Mercury	0.13	B		CV	B,P
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	118	U		P	
7782-49-2	Selenium	3.3	U		P	
7440-22-4	Silver	0.70	U		P	UL,O
7440-23-5	Sodium	249	U		P	
7440-28-0	Thallium	5.1	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.0	U		P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
EQB-13

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix (soil/water): WATER Lab Sample ID: R2810-4

Level (low/med): LOW Date Received: 12/10/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21.8	U		P	
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	2.5	U		P	
7440-39-3	Barium	0.37	B		P	B,P
7440-41-7	Beryllium	0.10	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	12.3	B		P	B,O
7440-47-3	Chromium	2.0	B		P	
7440-48-4	Cobalt	0.60	U		P	
7440-50-8	Copper	1.4	U		P	
7439-89-6	Iron	13.7	U		P	
7439-92-1	Lead	2.3	U		P	
7439-95-4	Magnesium	60.0	B		P	B,P
7439-96-5	Manganese	1.5	B		P	
7439-97-6	Mercury	0.11	B		CV	B,P
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	118	U		P	
7782-49-2	Selenium	3.3	U		P	
7440-22-4	Silver	0.70	U		P	UL,O
7440-23-5	Sodium	249	U		P	
7440-28-0	Thallium	5.1	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.0	B		P	B,O

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
EQB-14

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: R2810

Matrix (soil/water): WATER Lab Sample ID: R2810-5

Level (low/med): LOW Date Received: 12/11/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21.8	U		P	
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	2.5	U		P	
7440-39-3	Barium	0.37	B		P	B,P
7440-41-7	Beryllium	0.10	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	22.6	B		P	B,O
7440-47-3	Chromium	0.60	U		P	
7440-48-4	Cobalt	0.60	U		P	
7440-50-8	Copper	1.6	B		P	
7439-89-6	Iron	13.7	U		P	
7439-92-1	Lead	2.3	U		P	
7439-95-4	Magnesium	60.7	B		P	B,P
7439-96-5	Manganese	0.41	B		P	B,O
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	118	U		P	
7782-49-2	Selenium	3.7	B		P	K W
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	249	U		P	
7440-28-0	Thallium	5.1	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	1.0	U		P	B,O

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 2/24/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: R3810
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?			✓
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-).		✓	

Notes:

Collect	Extract	Analyzed
12/2/02	12/7/02	12/13/02
12/3/02	〃	12/14/02
12/5/02	12/9/02	12/11/02
12/9/02, 12/10/02	12/12/02	12/15/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.			✓

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: $r \geq 0.99$, %RSD $\leq$ 15% and %D $\leq$ 20%		✓	
	For initial Calibration: for %RSD > $\pm$ 15%, but < $\pm$ 50%, J(+) only. for %RSD > $\pm$ 50%, but < $\pm$ 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes:

atrazine RC in all

see attached

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓
	1 or more <10% / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high			
	Positives: L / J / L / K			
	Non-detects: R / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?			
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: 2-methylphenol (35%) 2,4-dimethylphenol (7% < QC Ri inacl-
see attached signal/QC acc ND, no flags

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓	✓	
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			✓

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 5			
12.1.2	Number of target compounds in each analysis: 65			
12.1.3	Number of results rejected and not reported: 15			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 95 %			

Notes:

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 2/26/03
DV Level: II (III) IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: R2810
Test Name: PEST
Method No.: 8081A

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?			✓
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		✓	

Notes: 0C1VC-1 CX1GC1 CVG1V2C1
12/5/02 12/3/02 12/9/02 12/11/02
12/9/02 12/11/02 12/14/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		

3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.			✓

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		

Notes:

See attached
all (ND), acceptable on other column, no flag

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?			✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?			✓

	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to			✓
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.			✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?			✓
5.4	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			✓
5.5	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).			
5.6	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).			
5.7	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).			
5.8	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).			

Notes:

6.0 Surrogate Recovery				**Yes**	**No**	**NA**
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?			✓		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			✓		
6.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?					✓
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)					✓
	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance		
	1 out	high/low	No action	No action		
	2 out	2 high same column	K	No action		

		2 low same column	L, UL	No action
		mixed same column	J, UJ	No action
		2 high diff columns	J	Not applicable
		2 low diff columns	J, UJ	Not applicable
		mixed diff columns	Professional judgement	Not applicable
	3 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		2 high, 1 low	K (2 high)	J (1 low 2nd column)
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
		other mixed	J, UJ	Not applicable
	4 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		Mixed	J, UJ	Not applicable
	If any recovery is >0% and <10% then L(+)/R(-).			
	If any recovery is 0% then R(+/-).			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?			
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?			
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?			

8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: It was noted by lab that a cocktail mixture was used.

Several 7 QC, all ND, no flag

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).			✓
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes:

11.0 Pesticide Cleanup Checks (Required when any positive result is reported > 38 ug/Kg for soils)		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
12.1.4	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100			

Notes:

"csmith" <csmith@compuchemlabs.com>
01/09/2003 01:48 PM

To: "Andrea Sansom \(E-mail\)" <Andrea_Sansom@URSCorp.com>
cc: "Bill Scott \(E-mail\)" <bscott@compuchemlabs.com>
Subject: 01/07 conference call items

Good afternoon Andrea,

I have attached a pdf file that contains the information concerning the incorrect spike mix used in the extraction of sample EQB-13 (R2810 8081A) and also the volatile forms 2 and 8 for SDGs Q, S and T2788 for evaluating the surrogates and internal standards. There will be no additional charge for the pesticide cleanup. Talk to you soon.

Chuck

RAD0109.pdf

Just comment that a cocktail mix was used-

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 2/24/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: RZ510
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

collect	extract	analyzed
12/4/02	12/9/02	12/15/02
12/5/02	12/3/02	〃
	12/9/02, 12/10/02	12/13/02	12/20/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			✓

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: See attached ccc pkg. "R" in no more action

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		✓	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: ECB-14 14-DNB 140% acc pkg flagged "R"

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			

NA

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			✓

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes: all < 6c all ND, P.K

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		✓	

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		✓	
10.1.1	Number of samples: 5			
10.1.3	Number of results rejected and not reported: 34			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness = ~~0%~~ 51%			

Notes: → ~~data rejected~~

5

14

34

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RA
Date: 2/24/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: R2810
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

Collected -	Extracted -	analyzed
12/2/02	12/7/02	12/19/02
12/3/02	"	"
12/5/02	12/10/02	"
12/9/10/02	12/13/02	12/20/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			✓

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: See attached
all NA, passed in ~~[illegible]~~ the other column, no action

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-), for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			✓
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			✓

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			✓

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		✓	

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			
	% Completeness = 100 %			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: PJ
Date: 02/05/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: P2810
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: Cooler temps: 3.0°C, 2.0°C, 2.0°C, 2.0°C

Sampled: 12/02/02, 12/03/02, 12/04/02, 12/10/02
Extracted: 12/09/02, 12/13/02
Analysis: 12/19/02, 12/20/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	X		

Notes: The samples in this SDG are not equipment blanks.

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).	X		
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? 50-150%	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?		X	
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?		X	
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			X
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			X
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: No MS/MSD set in this batch.

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: NO LCSD

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		X	
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.			X

Notes: No field duplicates in this batch.

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 5			
10.1.3	Number of results rejected and not reported: Ø			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: R2810
Project No.: 15291524.00000

Project Name: Radford SWMU 54
Reviewer: RA
Date: 2/24/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓		✓		
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{o}C \pm 2\ ^{o}C$)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes, % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: collect 12/2/3/4/5/10/02 analyzed 12/19/02 Hg) ICP

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%? <50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K		✓				

Note:

al 111.1 @ < ND, no flag
lead 137.7 " " "
Se 114 K low
Na 78 Low pos.
Tl 113.4 all ND no Flag

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓			✓		
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?	✓	✓			✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L						
4.5	Are there reported field blankor trip blank values > ± MDL?			✓			✓
	Sample Results > MDL						
	< 5X Blank Contamination B						

ICB pos, ba, mg, prev. neg. Ca ULO, silver ULO

Note: MB → Ba .367 1:5 303
Mg 60.76 } <5X → B, Z
Hg .107 .535

CCB → pos, ca, ba, be, mg, mn, zinc B, O

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+) — Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.						
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.						

Note: all EBs - Not panned ✓

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.						
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?						
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L						
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.						

Note: N/A all blanks ✓

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?						
10.2	Was a five-fold dilution performed?						
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).						

Note: N/A all blanks

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?						
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report						

Note: N/A

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?			✓			✓
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note: _____

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples:_____						
13.1.2	Number of target compounds in each analysis:_____						
13.1.3	Number of results rejected and not reported:_____						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = _____						

Note: _____

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1032

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Darren Rennie

Samplers: Fisher / Spangler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B17A	12/2/02 1015	S		X	S	E		2		X	X			X		X							Explosives including
545B17B	12/2/02 1030	S		X	S	E		2		X	X			X		X							Nitro Glycerin
545B18A	12/2/02 1045	S		X	S	E		2		X	X			X		X							
545B18B	12/2/02 1100	S		X	S	E		2		X	X			X		X							
545B19A	12/2/02 1110	S		X	S	E		2		X	X			X		X							
545B19B	12/2/02 1120	S		X	S	E		2		X	X			X		X							
545B20A	12/2/02 1515	S		X	S	E		2		X	X			X		X							
545B20B	12/2/02 1525	S		X	S	E		2		X	X			X		X							
545B21A	12/2/02 1535	S		X	S	E		2		X	X			X		X							
545B21B	12/2/02 1545	S		X	S	E		2		X	X			X		X							
D-10	12/2/02	S		X	S	E		2		X	X			V		X							
EQB-10	12/2/02 1630	S		X	S	E		4		X	X			X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. (Soil) Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO_3 + Ice
C. NaOH + Ice
D. H_2SO_4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. $NaHSO_4$ + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	12/2/02 1800				
Relinquished by:	Date/time	Received by: (for lab) Tracey J. Bailey	Date/Time 12-3-02 9:00 am	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

30°C

Radford Army Ammunition Plant
Chain Of Custody Record

No 1034 03

Project Number	Project Name
09604310	RFAAP

Project Contact (Name and Phone Number): Darrin Ranne

Samplers: F. Fisher / Ranne

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
EQB-10 11	12/3/02 1600	5		X	4	E		6		X	X	X	X	X		X							Explosives include Nitro Glycerin Per J. Spangler - Change ID to EQB-11 CS 12/4/02

Box #1			Box #2			Box #3	Box #4	
1. Surface Water	6. Trip Blank		A. HCl + Ice	F. Ice Only		F. Filtered	R. Rush - 3 Day	
2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other _____		U. Unfiltered	S. Standard 28 Day	
3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice			T. Timely 14 Day	
4. Rinsate	9. Other _____		D. H2SO4 + Ice	I. ZnAc + NaOH + Ice			O. Other _____	
5. Soil Sediment/Sludge			E. Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	12/3/02 1800				
Relinquished by:	Date/time	Received by: (for lab) Maureen Bailey	Date/Time 12/4/02 9:00am	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp: 2.0 °C

Radford Army Ammunition Plant
Chain Of Custody Record

No 1038

Project Number	Project Name
096045.10	RFAAP

Project Contact (Name and Phone Number): Darren Reeves

Samplers: Fisher / Spangler

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
EQB-12	12/4/02 1500	5		X	4	E		6		X	X	X	X	X		X							

ANALYSES

LAB:

AIRBILL No:

Courier:

Box #1			Box #2			Box #3	Box #4	
1. Surface Water	6. Trip Blank		A. HCl + Ice	F. Ice Only		F. Filtered	R. Rush - 3 Day	
2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other _____		U. Unfiltered	S. Standard 28 Day	
3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice			T. Timely 14 Day	
4. Rinsate	9. Other _____		D. H2SO4 + Ice	I. ZnAc + NaOH + Ice			O. Other _____	
5. Soil Sediment/Sludge			E. Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature] 12/4/02	1800				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 12/6/02 1020	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

2.0°C

52

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1041

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Darren Renne

Samplers: Fisher / Spagler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
EBQ-14	12/10/02 1600	5		X	4	E		4		X	X			X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature] 12/10/02	1800				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 12/11/02 0910	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

2.0°C

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: ___S2810___ **Fraction: _SVOCs, PAH, Pest, PCBs,Explosives,Nitroglycerin, Metals___**

Lab: _CompuChem___ **Project Name: __Radford SWMU 54_____**

Reviewer: _RA, AJ____ **Date: _____March 17, 2003_____**

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the SVOC analyses, the continuing calibration analyzed on 12/13/02 at 2150 displayed a %D greater than the QC limit (i.e., 20%) with a negative bias for atrazine at 53.45%. All associated sample results were non-detect and were flagged "R,c."

For the pesticide analyses, the recovery for surrogate tetrachloro-m-xylene (0%) in sample 54SB25B was less than the lower QC limit. Non-detects were flagged "R,s."

For the metals analyses, the MS/MSD recoveries for thallium (-92.4%/-66.4%) were less than the QC limit (i.e., 75-125%). All associated sample results were non-detect and were flagged "R,m."

Minor Anomalies: For the SVOC analyses, the initial calibration analyzed on 11/25/02 displayed %RSDs greater than the control limit (i.e., 15%) for benzaldehyde at 18.8%, 2,4-dimethylphenol at 17.4%, hexachlorocyclopentadiene at 17.6%, n-nitrosodiphenylamine at 15.8%, 4-chlorophenyl-phenylether at 18.7%, and atrazine at 69.7%. Positive results were flagged "J,r" and non-detects were flagged "UJ,r" for atrazine in the associated samples since it was the only failure that was serious enough (i.e., >50%) to affect the non-detects; unless previously flagged due to continuing calibration failure.

The CCV analyzed on 12/13/02 at 0915 displayed %Ds greater than the control limit (i.e., 20%) with a negative bias for at atrazine at 41.09% and with a positive bias for dimethylphthalate at 20.01%, 3-nitroaniline at 34.23%, diethylphthalate at 22.32%, 4-nitroaniline at 26.67%, and benzo(b)fluoranthene at 22.87%. The CCV analyzed on 12/13/02 at 2150 displayed a %D greater than the control limit with a negative bias for hexachlorocyclopentadiene at 27.48% and with a positive bias for 1,1-biphenyl at 20.66%. Associated samples were non-detect for the failures associated with negative biases and were flagged "UJ,c", unless

previously flagged due to an initial calibration anomaly. Positive results were flagged "J,c" for the failures associated with positive biases.

The equipment blank EQB-11 contained bis(2-ethylhexyl)phthalate at 10 ug/L. Positive results less than 10 times the blank concentration were flagged "B,x" in the associated samples.

The RPD for the MS/MSD analyzed on sample 54SB33B was greater than the QC limit (i.e., 43%) for 2,4-dimethylphenol at 73%. The associated parent sample result was non-detect and no data qualifying action was taken.

The RPD for the field duplicate pair 54SB31B/D-8 was greater than the QC limit (i.e., 35%) for di-n-buthylphthalate at 113%. No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

Several compounds exceeded the calibration range in sample 54SB27A and were flagged "E" by the laboratory. These results were flagged "J,q" by the reviewer. This sample was re-analyzed at a dilution factor of 4 with acceptable results and results from the dilution analyses should be used for the affected compounds.

For the pesticide analyses, the recoveries for surrogate tetrachlo-m-xylene in samples 54SB32BDL (DF=20) (420%), 54SB25B (685%), and 54SB32B (168%) were greater than the upper QC limit. No data qualifying action is required based on one surrogate failure and no data flags were applied. The recovery for surrogate tetrachloro-m-xylene (0%) in sample 54SB25B was less than the lower QC limit. Positive results were flagged "J,s." Surrogates were diluted out in sample 54SB25B (DF=50). No data qualifying action is required since the dilution factor is greater than 10.

The MS/MSD recoveries for beta-BHC (1250%/1500%) analyzed on sample 54SB33B were greater than the upper QC limit (i.e., 150%). The MS recovery for endosulfan I (45%) was less than the lower QC limit (i.e., 50%). These compounds were non-detect in the parent sample 54SB33B and were flagged "UJ,m." The RPD for methoxychlor (46%) was greater than the QC limit (i.e., 40%). This compound was a non-detect in the parent sample 54SB33B and no data qualifying action was taken.

The LCS recovery for 4,4-DDT (160%) was greater than the upper QC limit. Positive results were flagged "J,l" in the associated samples.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for some compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

Several compounds exceeded the calibration range in several samples and were flagged "E" by the laboratory. These results were flagged "J,q" by the reviewer. These samples were re-analyzed at different dilutions with acceptable non-detect results. Using professional judgement, the false positive bias was diluted out and the non-detects with elevated detection limits should be used for data interpretation.

For the PAH analyses, the continuing calibration analyzed on 12/20/02 at 0330 displayed a %D greater than the QC limit (i.e., 15%) with a negative bias for pyrene at 15.80%. The continuing calibration analyzed on 12/19/02 at 1315 displayed a %D greater than the QC limit with a negative bias for pyrene at 16.32%. Associated sample results were positive and were flagged "J,c."

The recoveries for surrogate p-terphenyl in samples D-8 (820%/1201%), 54SB34A (46%), and 54SB31B (230%) were outside the QC limit. Positive results were flagged "K,s" in samples D-8 and 54SB31B. Positive results were flagged "L,s" and non-detects were flagged "UL,s" in sample 54SB34A.

The MS/MSD recoveries for naphthalene (31%/44%) were less than the lower QC limits. The positive naphthalene result was flagged "J,m" in the parent sample 54SB33B. The RPDs for pyrene (26%), fluoranthene (31%), benzo(g,h,i)perylene (29%), benzo(a)anthracene (27%) and acenaphthylene (28%) were greater than the QC limit. No positive results were reported for these compounds in the parent sample 54SB33B and no data qualifying action was taken.

The RPD for the field duplicate pair 54SB31B/D-8 were greater than the QC limit (i.e., 35%) for all compounds except naphthalene and phenanthrene. No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for some compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

Several compounds exceeded the calibration range in some samples and were flagged "E" by the laboratory. These results were previously flagged "J,g" and no further data qualifying action was required. These samples were not reanalyzed at a dilution since the lower results between the two columns were originally reported by the laboratory. Subsequently, upon URS request, the laboratory re-evaluated and re-submitted these results based on the SW-846 requirement of reporting the higher concentration.

For the explosives analyses, the continuing calibration analyzed on 12/17/02 at 2137 displayed a %D greater than the QC limit (i.e., 15%) with a positive bias for

HMX at 19.47% on the initial column. The continuing calibration analyzed on 12/18/02 at 0655 displayed a %D greater than the QC limit with a positive bias for 2,4,6-trinitrotoluene at 16.38% on the initial column. The continuing calibration analyzed on 12/20/02 at 1954 displayed a %D greater than the QC limit with a positive bias for HMX at 27.89% on the initial column. The continuing calibration analyzed on 12/24/02 at 2249 displayed a %D greater than the QC limit with a negative bias for RDX at 22.4% and with a positive bias for 2,4,6-trinitrotoluene at 24.04% and tetryl at 22.51% on the second column. The continuing calibration analyzed on 12/25/02 at 0813 displayed a %D greater than the QC limit with a negative bias for RDX at 17.48% on the second column. The continuing calibration analyzed on 12/26/02 at 2053 displayed %Ds greater than the QC limit with a positive bias for 2,4,6-trinitrotoluene at 34.84% and tetryl at 27.82% on the second column. The continuing calibration analyzed on 12/27/02 at 0435 displayed a %D greater than the QC limit with a positive bias for 2,4,6-trinitrotoluene at 22.43% and with a negative bias for RDX at 25.28% on the second column. Positive results were flagged "J,c" for the failures associated with positive biases. No data flags were applied to the non-detects since the %Ds were acceptable on the other column.

The MS/MSD recoveries for tetryl (43%/43%) were less than the QC limit. The associated sample result was non-detect in the parent sample 54SB33B and was flagged "UJ,m."

The RPD between the two columns was greater than the QC limit (i.e., 40%) for 4-amino-2,6-dinitrotoluene (41.3%) in sample 54SB25B. This result was flagged "J,g."

For the nitroglycerin analyses, the recovery for surrogate 1,4-dinitrobenzene was greater than the upper QC limit at 292% in sample 54SB27A. The associated sample result was a non-detect and no data qualifying action was required.

The RPD between the two columns was greater than the QC limit (i.e., 40%) for nitroglycerin (199.9%) in sample 54SB32B. This result was flagged "J,g."

For the metal analyses, the initial CRDL percent recoveries for chromium (89.2%), iron (113%), lead (69.7%), potassium (63.4%), selenium (141.8%), sodium (112.3%), thallium (69.2%), and zinc (67.8%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "K,w" for sodium in the associated samples. All associated sample results were either greater than 2xCRDL or were previously flagged for the other analytes and no further data qualifying action was required.

The method blank displayed negative results for calcium, thallium and zinc and positive results for iron and nickel. All associated sample results were either

greater than 5 times the blank concentration or were previously flagged due to other anomalies and no further data qualifying action was required.

The initial and continuing calibration blanks also displayed positive results for antimony, iron, and magnesium; and negative results for calcium, lead, thallium, and zinc. All associated sample results were either greater than 5 times the blank concentration or were previously flagged due to other anomalies and no further data qualifying action was required.

Equipment blank EQB-11 located in SDG R2810 contained selenium at 3.4 ug/L. Positive results less than 5 times the blank concentration were flagged "B,x" in the associated samples.

The RPDs for the laboratory duplicate analysis were greater than the QC limit (i.e., 35%) for antimony at 165.7% and lead at 97.9%. Positive results were flagged "J,k."

The MS and/or MSD recoveries analyzed on sample 54SB33B were outside the QC limit for antimony (27.7%/28%) and mercury (44.3%/22.2%). All associated sample results were positive for antimony and were previously flagged due to laboratory duplicate anomalies. No further data qualifying action was required. All associated sample results were positive for mercury and were flagged "L,m."

The %Ds for the serial dilution analysis were greater than the QC limit (i.e., 10%) for barium (11.1%), calcium (10.5%), chromium (12.5%), cobalt (17.3%), copper (11.6%), iron (14.2%), lead (15.6%), magnesium (14%), manganese (15%), nickel (13.2%), vanadium (13.6%) and zinc (11.9%). Positive results were flagged "J,s", unless previously flagged due to other anomalies.

The RPDs for calcium (54%), magnesium (48%) and potassium (37%) were greater than the QC limit (i.e., 35%) for the field duplicate pair D-8/54SB31B. No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

Correctable Anomalies: Sample 54SB33A was not analyzed for pesticides and PCBs as requested on the chain of custody. Pesticide fluorosil cleanup was not performed on samples 54SB30A, 54SB32B, and 54SB32A.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were raised.

Positive TIC results were flagged "NJ,t" in the associated samples. It should be noted that if a given fraction (analysis) is not discussed in this report, it indicates that no anomalies were observed for that fraction. Except for data flagged "R", all data, as qualified, are usable for their intended purpose based on the data reviewed.

Signed: Ranjan

COC ID #

SAMPLENUM	CLIENTID	QUOTENUMREF	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
S2810-14	54SB25A	Q2810 1091	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-15	54SB25B	Q2810 ↓	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-1	54SB27A	Q2810 1090	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-2	54SB27B	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-3	54SB28A	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-4	54SB28B	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-5	54SB29A	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-6	54SB29B	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-7	54SB30A	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-8	54SB30B	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-9	54SB31A	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-10	54SB31B	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-12	54SB32A	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-13	54SB32B	Q2810 ↓	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-16	54SB33A	Q2810 1089	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-17	54SB33B	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-18	54SB34A	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-19	54SB34B	Q2810	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-20	54SB35A	Q2810 ↓	S2810	SO	URS	RADFORD SWMU 54	12/4/02
S2810-11	D-8	Q2810 1090	S2810	SO	URS	RADFORD SWMU 54	12/4/02

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB25A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-14B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U UJ,C
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	83	J
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB25A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-14B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
51-28-5	2,4-Dinitrophenol	2000	U	
100-02-7	4-Nitrophenol	800	U	
121-14-2	2,4-Dinitrotoluene	400	U	
132-64-9	Dibenzofuran	400	U	
84-66-2	Diethylphthalate	400	U	
7005-72-3	4-Chlorophenyl-phenylether	400	U	
86-73-7	Fluorene	400	U	
100-01-6	4-Nitroaniline	800	U	
534-52-1	4,6-Dinitro-2-methylphenol	800	U	
86-30-6	N-Nitrosodiphenylamine (1)	400	U	
101-55-3	4-Bromophenyl-phenylether	400	U	
118-74-1	Hexachlorobenzene	400	U	
1912-24-9	Atrazine	400	U	R IC
87-86-5	Pentachlorophenol	400	U	
85-01-8	Phenanthrene	400	U	
120-12-7	Anthracene	400	U	
86-74-8	Carbazole	400	U	
84-74-2	Di-n-butylphthalate	400	U	
206-44-0	Fluoranthene	52	J	
129-00-0	Pyrene	93	J	
85-68-7	Butylbenzylphthalate	400	U	
91-94-1	3,3'-Dichlorobenzidine	400	U	
117-81-7	bis(2-ethylhexyl)Phthalate	190	J	
56-55-3	Benzo(a)anthracene	52	J	
218-01-9	Chrysene	48	J	
117-84-0	Di-n-octylphthalate	400	U	
205-99-2	Benzo(b)fluoranthene	400	U	
207-08-9	Benzo(k)fluoranthene	50	J	
50-32-8	Benzo(a)pyrene	62	J	
193-39-5	Indeno(1,2,3-cd)pyrene	400	U	
53-70-3	Dibenzo(a,h)anthracene	400	U	
191-24-2	Benzo(g,h,i)perylene	40	J	

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB25A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-14B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.38~~	~~680~~	JB
2.		UNKNOWN (BC)	~~5.68~~	1300	JB
3.		~~UNKNOWN~~ PHTHALATE	18.30	~~380~~	J
4.	10152-69-9	CYCLOPROPANENONANOIC ACID, 2	18.65	330	NJ NJ+
5.					
6.					
7.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB25B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-15B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U UJ,C
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	280	J
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB25B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-15B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 19 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	810	U
121-14-2	2,4-Dinitrotoluene	160	J
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	810	U
534-52-1	4,6-Dinitro-2-methylphenol	810	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	U R1C
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	410	U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	220	J
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-octylphthalate	31	J
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB25B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-15B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.39	~~580~~	~~JB~~
2.		~~UNKNOWN (BC)~~	5.68	~~1200~~	~~JB~~
3.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	10.96	1300	NJ
4.		~~UNKNOWN~~	12.81	~~180~~	~~J~~
5.	35572-78-2	BENZENAMINE, 2-METHYL-3,5-DI	13.41	220	NJ
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB27A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-1A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	55	J
131-11-3	Dimethylphthalate	380	U
~~606-20-2~~	~~2,6-Dinitrotoluene~~	~~11000~~	~~E~~ J/B
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	770	U
83-32-9	Acenaphthene	380	U

use @54 1+ from DF=4 3/6/03

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB27A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-1A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 14 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	770	U
121-14-2	2,4-Dinitrotoluene	14000	E J, D
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	200	J J, C
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	770	U
534-52-1	4,6-Dinitro-2-methylphenol	770	U
86-30-6	N-Nitrosodiphenylamine (1)	1200	J, V
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U U J, V
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	800	
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	2600	
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

Use result From DF=4 EPA 3510 3

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB27A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-1A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 14 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 19

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.67~~	~~1300~~	~~JB~~
2.	88-72-2	BENZENE, 1-METHYL-2-NITRO-	7.63	1800	NJ
3.	99-08-1	BENZENE, 1-METHYL-3-NITRO-	7.90	410	NJ
4.	99-99-0	BENZENE, 1-METHYL-4-NITRO-	8.02	290	NJ
5.	610-39-9	BENZENE, 4-METHYL-1,2-DINITR	10.34	890	NJ
6.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	11.06	60000	NJ
7.		~~UNKNOWN~~	11.16	~~260~~	J
8.		UNKNOWN	12.23	180	J
9.		UNKNOWN	12.36	1400	J
10.		~~UNKNOWN~~	12.82	~~1100~~	J
11.	618-87-1	BENZENAMINE, 3,5-DINITRO-	12.99	500	NJ
12.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.17	690	NJ
13.		~~UNKNOWN~~	13.44	1900	J
14.	115-86-6	PHOSPHORIC ACID, TRIPHENYL E	17.13	170	NJ
15.		~~UNKNOWN~~	17.26	~~270~~	J
16.		STRAIGHT-CHAIN ALKANE	17.67	190	J
17.		STRAIGHT-CHAIN ALKANE	18.88	370	J
18.		UNKNOWN ALKANE	~~19.10~~	300	J
19.		UNKNOWN	21.38	~~280~~	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB27ADL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-1DB64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 14 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	1500	U
108-95-2	Phenol	1500	U
111-44-4	Bis(2-chloroethyl)ether	1500	U
95-57-8	2-Chlorophenol	1500	U
95-48-7	2-Methylphenol	1500	U
108-60-1	2,2'-oxybis(1-Chloropropane)	1500	U
98-86-2	Acetophenone	1500	U
106-44-5	4-Methylphenol	1500	U
621-64-7	N-Nitroso-di-N-propylamine	1500	U
67-72-1	Hexachloroethane	1500	U
98-95-3	Nitrobenzene	1500	U
78-59-1	Isophorone	1500	U
88-75-5	2-Nitrophenol	1500	U
105-67-9	2,4-Dimethylphenol	1500	U
111-91-1	Bis(2-chloroethoxy)methane	1500	U
120-83-2	2,4-Dichlorophenol	1500	U
91-20-3	Naphthalene	1500	U
106-47-8	4-Chloroaniline	1500	U
87-68-3	Hexachlorobutadiene	1500	U
105-60-2	Caprolactam	1500	U
59-50-7	4-Chloro-3-methylphenol	1500	U
91-57-6	2-Methylnaphthalene	1500	U
77-47-4	Hexachlorocyclopentadiene	1500	U
88-06-2	2,4,6-Trichlorophenol	1500	U
95-95-4	2,4,5-Trichlorophenol	1500	U
92-52-4	1,1'-Biphenyl	1500	U
91-58-7	2-Chloronaphthalene	1500	U
88-74-4	2-Nitroaniline	3100	U
131-11-3	Dimethylphthalate	1500	U
606-20-2	2,6-Dinitrotoluene	10000	D
208-96-8	Acenaphthylene	1500	U
99-09-2	3-Nitroaniline	3100	U
83-32-9	Acenaphthene	1500	U

RA 3,10,03

UJ,c

UG SOIL

RA 3,10,03

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB27ADL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-1DB64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 14 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	7700	U
100-02-7	4-Nitrophenol	3100	U
121-14-2	2,4-Dinitrotoluene	14000	D
132-64-9	Dibenzofuran	1500	U
84-66-2	Diethylphthalate	240	DJ
7005-72-3	4-Chlorophenyl-phenylether	1500	U
86-73-7	Fluorene	1500	U
100-01-6	4-Nitroaniline	3100	U
534-52-1	4,6-Dinitro-2-methylphenol	3100	U
86-30-6	N-Nitrosodiphenylamine (1)	1100	DJ
101-55-3	4-Bromophenyl-phenylether	1500	U
118-74-1	Hexachlorobenzene	1500	U
1912-24-9	Atrazine	1500	U
87-86-5	Pentachlorophenol	1500	U
85-01-8	Phenanthrene	1500	U
120-12-7	Anthracene	1500	U
86-74-8	Carbazole	1500	U
84-74-2	Di-n-butylphthalate	800	DJ
206-44-0	Fluoranthene	1500	U
129-00-0	Pyrene	1500	U
85-68-7	Butylbenzylphthalate	1500	U
91-94-1	3,3'-Dichlorobenzidine	1500	U
117-81-7	bis(2-ethylhexyl)Phthalate	2300	D
56-55-3	Benzo(a)anthracene	1500	U
218-01-9	Chrysene	1500	U
117-84-0	Di-n-octylphthalate	1500	U
205-99-2	Benzo(b)fluoranthene	1500	U
207-08-9	Benzo(k)fluoranthene	1500	U
50-32-8	Benzo(a)pyrene	1500	U
193-39-5	Indeno(1,2,3-cd)pyrene	1500	U
53-70-3	Dibenzo(a,h)anthracene	1500	U
191-24-2	Benzo(g,h,i)perylene	1500	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB27ADL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-1DB64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.40	920	~~JBD~~
2.		~~UNKNOWN (BC)~~	5.66	1600	~~JBD~~
3.	88-72-2	BENZENE, 1-METHYL-2-NITRO-	7.63	1800	NJD NJT, t
4.	610-39-9	BENZENE, 4-METHYL-1,2-DINITR	10.34	890	NJD
5.		~~UNKNOWN~~	10.93	2600	~~JD~~
6.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	11.01	63000	NJD NJT, t
7.		~~UNKNOWN~~	12.36	1400	~~JD~~
8.		UNKNOWN ALKYNE	12.80	1200	JD
9.		UNKNOWN	13.17	690	JD
10.		UNKNOWN	13.43	2100	JD
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB27B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-2A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	110	J
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB27B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-2A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	57	J
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U UJ,Ir
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	56	J B,QC
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	42	J
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB27B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-2A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.68	~~1700~~	~~JB~~
2.		UNKNOWN SILOXANE	7.45	210	J
3.		UNKNOWN	~~10.95~~	220	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB28A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-3A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB28A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-3A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	40	J
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U UJ,r
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	200	J
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl) Phthalate	79	J B,x
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	320	J
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM I
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB28A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-3A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 14

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.37	710	JB
2.		UNKNOWN (BC)	5.67	1300	JB
3.		UNKNOWN	6.13	170	J
4.		UNKNOWN PHTHALATE	18.90	260	J
5.		UNKNOWN PHTHALATE	19.02	230	J
6.		UNKNOWN PHTHALATE	19.32	470	J
7.		UNKNOWN PHTHALATE	19.46	870	J
8.		UNKNOWN PHTHALATE	19.56	450	J
9.		UNKNOWN	19.64	630	J
10.		UNKNOWN PHTHALATE	19.70	540	J
11.		UNKNOWN PHTHALATE	19.78	540	J
12.		UNKNOWN PHTHALATE	19.83	340	J
13.		UNKNOWN PHTHALATE	19.91	210	J
14.		UNKNOWN PHTHALATE	19.98	250	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB28B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-4A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NC.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	830	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	830	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB28B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-4A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	830	U
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	830	U
534-52-1	4,6-Dinitro-2-methylphenol	830	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	U UJ|C
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	410	U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	410	U
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-octylphthalate	35	J
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB28B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-4A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 20 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.58	780	JB
2.		UNKNOWN (BC)	5.68	1400	JB
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB29A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-5A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB29A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-5A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U J, R
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	61	J B, Z
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB29A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-5A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	550	JB
2.		UNKNOWN (BC)	5.67	1100	JB
3.		UNKNOWN	22.26	580	J
4.		UNKNOWN	22.47	1100	J
5.		UNKNOWN	22.90	680	J
6.		UNKNOWN	22.95	600	J
7.		UNKNOWN	23.02	170	J
8.		UNKNOWN	23.55	320	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB29B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-6A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB29B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-6A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 21 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
51-28-5	2,4-Dinitrophenol	2100	U	
100-02-7	4-Nitrophenol	840	U	
121-14-2	2,4-Dinitrotoluene	420	U	
132-64-9	Dibenzofuran	420	U	
84-66-2	Diethylphthalate	420	U	
7005-72-3	4-Chlorophenyl-phenylether	420	U	
86-73-7	Fluorene	420	U	
100-01-6	4-Nitroaniline	840	U	
534-52-1	4,6-Dinitro-2-methylphenol	840	U	
86-30-6	N-Nitrosodiphenylamine (1)	420	U	
101-55-3	4-Bromophenyl-phenylether	420	U	
118-74-1	Hexachlorobenzene	420	U	
1912-24-9	Atrazine	420	U	JIV
87-86-5	Pentachlorophenol	420	U	
85-01-8	Phenanthrene	420	U	
120-12-7	Anthracene	420	U	
86-74-8	Carbazole	420	U	
84-74-2	Di-n-butylphthalate	420	U	
206-44-0	Fluoranthene	420	U	
129-00-0	Pyrene	420	U	
85-68-7	Butylbenzylphthalate	420	U	
91-94-1	3,3'-Dichlorobenzidine	420	U	
117-81-7	bis(2-ethylhexyl)Phthalate	70	J	B, K
56-55-3	Benzo(a)anthracene	420	U	
218-01-9	Chrysene	420	U	
117-84-0	Di-n-octylphthalate	420	U	
205-99-2	Benzo(b)fluoranthene	420	U	
207-08-9	Benzo(k)fluoranthene	420	U	
50-32-8	Benzo(a)pyrene	420	U	
193-39-5	Indeno(1,2,3-cd)pyrene	420	U	
53-70-3	Dibenzo(a,h)anthracene	420	U	
191-24-2	Benzo(g,h,i)perylene	420	U	

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB29B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-6A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.37	730	JB
2.		UNKNOWN (BC)	5.67	1600	JB
3.		UNKNOWN SILOXANE	7.46	200	J
4.					
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB30A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-7A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	770	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	500	
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	770	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB30A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-7A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 14 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	770	U
121-14-2	2,4-Dinitrotoluene	500	
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	460	J,C
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	770	U
534-52-1	4,6-Dinitro-2-methylphenol	770	U
86-30-6	N-Nitrosodiphenylamine (1)	66	J,J,C
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U,U,J,C
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	65	J
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	120	J
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB30A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-7A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.37~~	~~670~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.67~~	~~1200~~	~~JB~~
3.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	10.96	1300	NJ NJT
4.		~~UNKNOWN~~	~~11.77~~	~~740~~	~~J~~
5.		~~UNKNOWN~~	12.80	~~390~~	~~J~~
6.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.16	330	NJ NJT
7.		~~UNKNOWN~~	13.41	~~630~~	~~J~~
8.		UNKNOWN	~~22.14~~	~~170~~	~~J~~
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB30B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-8A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB30B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-8A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U JJ1
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB30B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-8A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.38	650	JB
2.		UNKNOWN (BC)	5.68	1300	JB
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB31A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-9A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB31A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-9A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	840	U
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	420	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	U UJ JP
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	420	U
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	U
206-44-0	Fluoranthene	40	J
129-00-0	Pyrene	56	J
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	420	U
56-55-3	Benzo(a)anthracene	420	U
218-01-9	Chrysene	420	U
117-84-0	Di-n-octylphthalate	420	U
205-99-2	Benzo(b)fluoranthene	420	U
207-08-9	Benzo(k)fluoranthene	420	U
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	420	U
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	420	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB31A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-9A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.37	900	JB
2.		UNKNOWN (BC)	5.69	1900	JB
3.		UNKNOWN	21.38	170	J
4.					
5.					
6.					
7.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB31B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-10A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	40	J
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB31B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-10A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	76	J
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	140	J JC
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	30	J JIC
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U UJIC
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	130	J
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	140	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB31B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-10A64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/13/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.39~~	~~360~~	~~JB~~
2.		~~UNKNOWN (BC)~~	5.67	~~1300~~	~~JB~~
3.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	10.96	180	NJ NJ+
4.		~~UNKNOWN~~	~~12.36~~	~~180~~	~~J~~
5.	10544-50-0	SULFUR, MOL. (S8)	14.10	190	NJ UJ+
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB32A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-12B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U UJ,C
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB32A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-12B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	430	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	680	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	110	J J,r
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R,c
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	550	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	82	J B,c
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.
54SB32A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-12B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.37~~	~~570~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.68~~	~~1200~~	~~JB~~
3.		~~UNKNOWN~~	~~8.80~~	~~360~~	~~J~~
4.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	10.96	2000	NJ NJ, t
5.		~~UNKNOWN~~	~~12.81~~	~~160~~	~~J~~
6.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.18	370	NJ NJ, t
7.		~~UNKNOWN~~	~~13.41~~	~~320~~	~~J~~
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB32B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-13B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U UJ, C
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	560	
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB32B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-13B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
51-28-5	2,4-Dinitrophenol	2000	U	
100-02-7	4-Nitrophenol	790	U	
121-14-2	2,4-Dinitrotoluene	1100		
132-64-9	Dibenzofuran	390	U	
84-66-2	Diethylphthalate	320	J	
7005-72-3	4-Chlorophenyl-phenylether	390	U	
86-73-7	Fluorene	390	U	
100-01-6	4-Nitroaniline	790	U	
534-52-1	4,6-Dinitro-2-methylphenol	790	U	
86-30-6	N-Nitrosodiphenylamine (1)	76	J	JIR
101-55-3	4-Bromophenyl-phenylether	390	U	
118-74-1	Hexachlorobenzene	390	U	
1912-24-9	Atrazine	390	U	R1C
87-86-5	Pentachlorophenol	390	U	
85-01-8	Phenanthrene	390	U	
120-12-7	Anthracene	390	U	
86-74-8	Carbazole	390	U	
84-74-2	Di-n-butylphthalate	250	J	
206-44-0	Fluoranthene	390	U	
129-00-0	Pyrene	390	U	
85-68-7	Butylbenzylphthalate	390	U	
91-94-1	3,3'-Dichlorobenzidine	390	U	
117-81-7	bis(2-ethylhexyl)Phthalate	160	J	
56-55-3	Benzo(a)anthracene	390	U	
218-01-9	Chrysene	390	U	
117-84-0	Di-n-octylphthalate	390	U	
205-99-2	Benzo(b)fluoranthene	390	U	
207-08-9	Benzo(k)fluoranthene	390	U	
50-32-8	Benzo(a)pyrene	390	U	
193-39-5	Indeno(1,2,3-cd)pyrene	390	U	
53-70-3	Dibenzo(a,h)anthracene	390	U	
191-24-2	Benzo(g,h,i)perylene	390	U	

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB32B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-13B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	620	JB
2.		UNKNOWN (BC)	5.67	1100	JB
3.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	11.15	130000	NJ
4.		UNKNOWN	12.38	240	J
5.		UNKNOWN	12.84	880	J
6.	618-87-1	BENZENAMINE, 3,5-DINITRO-	13.01	200	NJ
7.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.19	230	NJ
8.		UNKNOWN	13.46	1200	J
9.		UNKNOWN	23.56	180	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB33A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-16B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	UUJ,C
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB33A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-16B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R,C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	64	J
206-44-0	Fluoranthene	37	J
129-00-0	Pyrene	44	J
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	290	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	100	J
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB33A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-16B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	370	JB
2.		UNKNOWN (BC)	5.67	1200	JB
3.		UNKNOWN CARBOXYLIC ACID	19.14	290	J
4.		UNKNOWN	19.32	250	J
5.		UNKNOWN	19.48	340	J
6.		UNKNOWN	19.64	330	J
7.		UNKNOWN CARBOXYLIC ACID	19.69	330	J
8.		UNKNOWN CARBOXYLIC ACID	19.78	390	J
9.		UNKNOWN PHTHALATE	19.85	280	J
10.		UNKNOWN PHTHALATE	19.93	240	J
11.		UNKNOWN PAH	19.98	270	J
12.		UNKNOWN PAH	20.05	200	J
13.		UNKNOWN	20.24	190	J
14.		UNKNOWN	20.32	250	J
15.		UNKNOWN	20.61	270	J
16.		UNKNOWN	21.38	330	J
17.		UNKNOWN PAH	21.64	250	J
18.		UNKNOWN	21.84	250	J
19.		UNKNOWN PAH	21.96	200	J
20.		UNKNOWN	22.28	220	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB33B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-17B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U UJ, C
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	28	J
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB33B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-17B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
51-28-5	2,4-Dinitrophenol	2000	U	
100-02-7	4-Nitrophenol	800	U	
121-14-2	2,4-Dinitrotoluene	220	J	
132-64-9	Dibenzofuran	400	U	
84-66-2	Diethylphthalate	210	J	
7005-72-3	4-Chlorophenyl-phenylether	400	U	
86-73-7	Fluorene	400	U	
100-01-6	4-Nitroaniline	800	U	
534-52-1	4,6-Dinitro-2-methylphenol	800	U	
86-30-6	N-Nitrosodiphenylamine (1)	130	J	JJV
101-55-3	4-Bromophenyl-phenylether	400	U	
118-74-1	Hexachlorobenzene	400	U	
1912-24-9	Atrazine	400	U	R,C
87-86-5	Pentachlorophenol	400	U	
85-01-8	Phenanthrene	400	U	
120-12-7	Anthracene	400	U	
86-74-8	Carbazole	400	U	
84-74-2	Di-n-butylphthalate	340	J	
206-44-0	Fluoranthene	41	J	
129-00-0	Pyrene	34	J	
85-68-7	Butylbenzylphthalate	400	U	
91-94-1	3,3'-Dichlorobenzidine	400	U	
117-81-7	bis(2-ethylhexyl)Phthalate	85	J	B,C
56-55-3	Benzo(a)anthracene	400	U	
218-01-9	Chrysene	400	U	
117-84-0	Di-n-octylphthalate	400	U	
205-99-2	Benzo(b)fluoranthene	400	U	
207-08-9	Benzo(k)fluoranthene	400	U	
50-32-8	Benzo(a)pyrene	400	U	
193-39-5	Indeno(1,2,3-cd)pyrene	400	U	
53-70-3	Dibenzo(a,h)anthracene	400	U	
191-24-2	Benzo(g,h,i)perylene	400	U	

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB33B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-17B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	460	JB
2.		UNKNOWN (BC)	5.67	1600	JB
3.		UNKNOWN	12.36	230	J
4.		UNKNOWN	22.16	190	J
5.					
6.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB34A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-18B64

Level: (Low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U J,C
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB34A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-18B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
51-28-5	2,4-Dinitrophenol	2000	U	
100-02-7	4-Nitrophenol	800	U	
121-14-2	2,4-Dinitrotoluene	400	U	
132-64-9	Dibenzofuran	400	U	
84-66-2	Diethylphthalate	120	J	
7005-72-3	4-Chlorophenyl-phenylether	400	U	
86-73-7	Fluorene	400	U	
100-01-6	4-Nitroaniline	800	U	
534-52-1	4,6-Dinitro-2-methylphenol	800	U	
86-30-6	N-Nitrosodiphenylamine (1)	400	U	
101-55-3	4-Bromophenyl-phenylether	400	U	
118-74-1	Hexachlorobenzene	400	U	
1912-24-9	Atrazine	400	U	R,C
87-86-5	Pentachlorophenol	400	U	
85-01-8	Phenanthrene	400	U	
120-12-7	Anthracene	400	U	
86-74-8	Carbazole	400	U	
84-74-2	Di-n-butylphthalate	49	J	
206-44-0	Fluoranthene	400	U	
129-00-0	Pyrene	400	U	
85-68-7	Butylbenzylphthalate	400	U	
91-94-1	3,3'-Dichlorobenzidine	400	U	
117-81-7	bis(2-ethylhexyl)Phthalate	75	J	B,R
56-55-3	Benzo(a)anthracene	400	U	
218-01-9	Chrysene	400	U	
117-84-0	Di-n-octylphthalate	140	J	
205-99-2	Benzo(b)fluoranthene	400	U	
207-08-9	Benzo(k)fluoranthene	400	U	
50-32-8	Benzo(a)pyrene	400	U	
193-39-5	Indeno(1,2,3-cd)pyrene	400	U	
53-70-3	Dibenzo(a,h)anthracene	400	U	
191-24-2	Benzo(g,h,i)perylene	400	U	

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB34A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-18B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	380	JB
2.		UNKNOWN (BC)	5.67	1100	JB
3.		UNKNOWN	8.58	230	J
4.	57-10-3	HEXADECANOIC ACID	12.80	180	NJ
5.	112-80-1	OLEIC ACID	14.80	740	NJ
6.		UNKNOWN	18.90	180	J
7.		UNKNOWN	19.17	230	J
8.		UNKNOWN CARBOXYLIC ACID	19.32	430	J
9.		UNKNOWN	19.41	230	J
10.		UNKNOWN CARBOXYLIC ACID	19.47	410	J
11.		UNKNOWN	19.51	210	J
12.		UNKNOWN CARBOXYLIC ACID	19.56	400	J
13.		UNKNOWN	19.64	440	J
14.		UNKNOWN CARBOXYLIC ACID	19.69	350	J
15.		UNKNOWN	19.74	190	J
16.		UNKNOWN CARBOXYLIC ACID	19.78	260	J
17.		UNKNOWN	19.83	290	J
18.		UNKNOWN	19.91	200	J
19.		UNKNOWN ALKANE	19.96	220	J
20.		UNKNOWN	21.23	220	J
21.					
22.					
23.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB34B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-19B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 22 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	850	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	850	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB34B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-19B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 22 decanted: (Y/N) N Date Extracted: 12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	850	U
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	850	U
534-52-1	4,6-Dinitro-2-methylphenol	850	U
86-30-6	N-Nitrosodiphenylamine (1)	420	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	U R1C
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	420	U
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	U
206-44-0	Fluoranthene	420	U
129-00-0	Pyrene	420	U
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	420	U
56-55-3	Benzo(a)anthracene	420	U
218-01-9	Chrysene	420	U
117-84-0	Di-n-octylphthalate	420	U
205-99-2	Benzo(b)fluoranthene	420	U
207-08-9	Benzo(k)fluoranthene	420	U
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	420	U
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	420	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB34B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-19B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 22 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.39	450	JB
2.		UNKNOWN (BC)	5.67	1500	JB
3.					
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-8

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-11B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	120	J
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-8

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-11B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
51-28-5	2,4-Dinitrophenol	2000	U	
100-02-7	4-Nitrophenol	800	U	
121-14-2	2,4-Dinitrotoluene	400	U	
132-64-9	Dibenzofuran	400	U	
84-66-2	Diethylphthalate	400	U	
7005-72-3	4-Chlorophenyl-phenylether	400	U	
86-73-7	Fluorene	400	U	
100-01-6	4-Nitroaniline	800	U	
534-52-1	4,6-Dinitro-2-methylphenol	800	U	
86-30-6	N-Nitrosodiphenylamine (1)	400	U	
101-55-3	4-Bromophenyl-phenylether	400	U	
118-74-1	Hexachlorobenzene	400	U	
1912-24-9	Atrazine	400	U	R,C
87-86-5	Pentachlorophenol	400	U	
85-01-8	Phenanthrene	51	J	
120-12-7	Anthracene	51	J	
86-74-8	Carbazole	400	U	
84-74-2	Di-n-butylphthalate	36	J	
206-44-0	Fluoranthene	270	J	
129-00-0	Pyrene	600		
85-68-7	Butylbenzylphthalate	400	U	
91-94-1	3,3'-Dichlorobenzidine	400	U	
117-81-7	bis(2-ethylhexyl)Phthalate	140	J	
56-55-3	Benzo(a)anthracene	290	J	
218-01-9	Chrysene	370	J	
117-84-0	Di-n-octylphthalate	570		
205-99-2	Benzo(b)fluoranthene	160	J	
207-08-9	Benzo(k)fluoranthene	260	J	
50-32-8	Benzo(a)pyrene	250	J	
193-39-5	Indeno(1,2,3-cd)pyrene	150	J	
53-70-3	Dibenzo(a,h)anthracene	72	J	
191-24-2	Benzo(g,h,i)perylene	150	J	

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-8

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S2810-11B64

Level: (low/med) LOW Date Received: 12/04/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/09/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/14/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.68	1500	JB
2.		UNKNOWN	19.18	680	J
3.		UNKNOWN	19.30	560	J
4.	28553-12-0	1,2-BENZENEDICARBOXYLIC ACID	19.33	1400	NJ
5.		BRANCHED ALKANE	19.45	930	J
6.		UNKNOWN	19.48	1300	J
7.		UNKNOWN	19.65	1100	J
8.	10152-69-9	CYCLOPROPANENONANOIC ACID, 2	19.70	1300	NJ
9.		UNKNOWN	19.75	740	J
10.		UNKNOWN CARBOXYLIC ACID	19.79	950	J
11.		UNKNOWN PHTHALATE	19.85	990	J
12.		UNKNOWN CARBOXYLIC ACID	19.92	740	J
13.	192-97-2	BENZO[E]PYRENE	19.99	740	NJ
14.	207-08-9	BENZO[K]FLUORANTHENE	20.05	740	NJ
15.		UNKNOWN	20.60	550	J
16.		UNKNOWN	21.39	610	J
17.		UNKNOWN PAH	21.52	610	J
18.		UNKNOWN	22.39	700	J
19.		UNKNOWN	22.47	740	J
20.		UNKNOWN	22.59	690	J
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

FORM I SV-TIC

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB25A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.1	U
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.1	U
50-29-3	4,4'-DDT	2.1	J J, 2
60-57-1	Dieldrin	2.1	U
959-98-8	Endosulfan I	2.1	U
33213-65-9	Endosulfan II	4.0	U
1031-07-8	Endosulfan sulfate	1.8	JP J, 2
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	1.0	U
72-43-5	Methoxychlor	10	U
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	79	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	79	U
53469-21-9	Aroclor-1242	55	U
12672-29-6	Aroclor-1248	55	U
11097-69-1	Aroclor-1254	55	U
11096-82-5	Aroclor-1260	79	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.1	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB25B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U R,S
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.1	U
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.1	U
72-55-9	4,4'-DDE	2.1	U
50-29-3	4,4'-DDT	17	J,S
60-57-1	Dieldrin	2.1	U R,S
959-98-8	Endosulfan I	2.1	U
33213-65-9	Endosulfan II	4.1	U
1031-07-8	Endosulfan sulfate	4.1	U
72-20-8	Endrin	4.1	U
7421-93-4	Endrin Aldehyde	26	P J,S
76-44-8	Heptachlor	1.0	U R,S
1024-57-3	Heptachlor Epoxide	280	EP J,S
72-43-5	Methoxychlor	10	U R,S
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	80	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	80	U
53469-21-9	Aroclor-1242	56	U
12672-29-6	Aroclor-1248	56	U
11097-69-1	Aroclor-1254	56	U
11096-82-5	Aroclor-1260	80	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	13	E J,S
5103-71-9	alpha-Chlordane	2.1	U R,S

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB25BDL

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/21/02

Injection Volume: 2.0(uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	51	U
319-84-6	alpha-BHC	51	U
319-85-7	beta-BHC	100	U
319-86-8	delta-BHC	51	U
58-89-9	gamma-BHC (Lindane)	51	U
72-54-8	4,4'-DDD	200	U
72-55-9	4,4'-DDE	100	U
50-29-3	4,4'-DDT	310	U
60-57-1	Dieldrin	100	U
959-98-8	Endosulfan I	100	U
33213-65-9	Endosulfan II	200	U
1031-07-8	Endosulfan sulfate	200	U
72-20-8	Endrin	200	U
7421-93-4	Endrin Aldehyde	200	U
76-44-8	Heptachlor	51	U
1024-57-3	Heptachlor Epoxide	51	U
72-43-5	Methoxychlor	510	U
8001-35-2	Toxaphene	5100	U
12674-11-2	Aroclor-1016	4000	U
11104-28-2	Aroclor-1221	5200	U
11141-16-5	Aroclor-1232	4000	U
53469-21-9	Aroclor-1242	2800	U
12672-29-6	Aroclor-1248	2800	U
11097-69-1	Aroclor-1254	2800	U
11096-82-5	Aroclor-1260	4000	U
53494-70-5	Endrin Ketone	510	U
5103-74-2	gamma-Chlordane	51	U
5103-71-9	alpha-Chlordane	100	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB30A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.97	U
319-84-6	alpha-BHC	0.97	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	0.50	J
58-89-9	gamma-BHC (Lindane)	1.6	
72-54-8	4,4'-DDD	3.8	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	4.1	JP J,J
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.8	U
1031-07-8	Endosulfan sulfate	3.8	U
72-20-8	Endrin	3.8	U
7421-93-4	Endrin Aldehyde	1.2	J
76-44-8	Heptachlor	4.8	P J,J
~~1024-57-3~~	~~Heptachlor Epoxide~~	~~53~~	~~E~~ J,J
72-43-5	Methoxychlor	7.4	JP J,J
8001-35-2	Toxaphene	97	U
12674-11-2	Aroclor-1016	76	U
11104-28-2	Aroclor-1221	99	U
11141-16-5	Aroclor-1232	76	U
53469-21-9	Aroclor-1242	52	U
12672-29-6	Aroclor-1248	52	U
11097-69-1	Aroclor-1254	52	U
11096-82-5	Aroclor-1260	76	U
53494-70-5	Endrin Ketone	9.7	U
5103-74-2	gamma-Chlordane	0.97	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB30ADL

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/14/02

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	9.7	U
319-84-6	alpha-BHC	9.7	U
319-85-7	beta-BHC	3600	DEP
319-86-8	delta-BHC	9.7	U
58-89-9	gamma-BHC (Lindane)	9.7	U
72-54-8	4,4'-DDD	38	U
72-55-9	4,4'-DDE	20	U
50-29-3	4,4'-DDT	7.2	DJ
60-57-1	Dieldrin	20	U
959-98-8	Endosulfan I	20	U
33213-65-9	Endosulfan II	38	U
1031-07-8	Endosulfan sulfate	38	U
72-20-8	Endrin	38	U
7421-93-4	Endrin Aldehyde	38	U
76-44-8	Heptachlor	6.9	DJ
1024-57-3	Heptachlor Epoxide	9.7	U
72-43-5	Methoxychlor	97	U
8001-35-2	Toxaphene	970	U
12674-11-2	Aroclor-1016	760	U
11104-28-2	Aroclor-1221	990	U
11141-16-5	Aroclor-1232	760	U
53469-21-9	Aroclor-1242	520	U
12672-29-6	Aroclor-1248	520	U
11097-69-1	Aroclor-1254	520	U
11096-82-5	Aroclor-1260	760	U
53494-70-5	Endrin Ketone	97	U
5103-74-2	gamma-Chlordane	9.7	U
5103-71-9	alpha-Chlordane	20	U

Use only this result RA 3/28/03

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB30B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.1	U
319-86-8	delta-BHC	0.46	J
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.1	U
50-29-3	4,4'-DDT	6.1	U
60-57-1	Dieldrin	2.1	U
959-98-8	Endosulfan I	2.1	U
33213-65-9	Endosulfan II	4.0	U
1031-07-8	Endosulfan sulfate	4.0	U
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	7.4	
72-43-5	Methoxychlor	10	U
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	79	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	79	U
53469-21-9	Aroclor-1242	55	U
12672-29-6	Aroclor-1248	55	U
11097-69-1	Aroclor-1254	55	U
11096-82-5	Aroclor-1260	79	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.1	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB32A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	6.0	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	4.0	U
~~1031-07-8~~	~~Endosulfan sulfate~~	~~100~~	~~EP~~
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.1	
~~1024-57-3~~	~~Heptachlor Epoxide~~	~~61~~	~~E~~
72-43-5	Methoxychlor	10	U
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	78	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	78	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Aroclor-1254	54	U
11096-82-5	Aroclor-1260	78	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB32ADL

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/14/02

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	10	U
319-84-6	alpha-BHC	10	U
319-85-7	beta-BHC	20	U
319-86-8	delta-BHC	10	U
58-89-9	gamma-BHC (Lindane)	10	U
72-54-8	4,4'-DDD	40	U
72-55-9	4,4'-DDE	20	U
50-29-3	4,4'-DDT	60	U
60-57-1	Dieldrin	20	U
959-98-8	Endosulfan I	20	U
33213-65-9	Endosulfan II	40	U
1031-07-8	Endosulfan sulfate	40	U
72-20-8	Endrin	40	U
7421-93-4	Endrin Aldehyde	40	U
76-44-8	Heptachlor	10	U
1024-57-3	Heptachlor Epoxide	110	DE J
72-43-5	Methoxychlor	100	U
8001-35-2	Toxaphene	1000	U
12674-11-2	Aroclor-1016	780	U
11104-28-2	Aroclor-1221	1000	U
11141-16-5	Aroclor-1232	780	U
53469-21-9	Aroclor-1242	540	U
12672-29-6	Aroclor-1248	540	U
11097-69-1	Aroclor-1254	540	U
11096-82-5	Aroclor-1260	780	U
53494-70-5	Endrin Ketone	100	U
5103-74-2	gamma-Chlordane	10	U
5103-71-9	alpha-Chlordane	20	U

use endosulfan sulfate and heptachlor epoxide ONLY

use only 14 C

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB32B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.99	U
319-84-6	alpha-BHC	0.99	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	0.99	U
58-89-9	gamma-BHC (Lindane)	0.99	U
72-54-8	4,4'-DDD	3.9	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	12	J, X
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
72-20-8	Endrin	3.9	U
7421-93-4	Endrin Aldehyde	1.4	J
76-44-8	Heptachlor	0.99	U
~~1024-57-3~~	~~Heptachlor Epoxide~~	~~200~~	~~EP~~ J, Q
72-43-5	Methoxychlor	9.9	U
8001-35-2	Toxaphene	99	U
12674-11-2	Aroclor-1016	77	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	77	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Aroclor-1254	54	U
11096-82-5	Aroclor-1260	77	U
53494-70-5	Endrin Ketone	9.9	U
5103-74-2	gamma-Chlordane	0.99	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB32BDL

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/14/02

Injection Volume: 2.0(uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	20	U
319-84-6	alpha-BHC	20	U
319-85-7	beta-BHC	40	U
319-86-8	delta-BHC	20	U
58-89-9	gamma-BHC (Lindane)	20	U
72-54-8	4,4'-DDD	79	U
72-55-9	4,4'-DDE	40	U
50-29-3	4,4'-DDT	11	DJ
60-57-1	Dieldrin	40	U
959-98-8	Endosulfan I	40	U
33213-65-9	Endosulfan II	79	U
1031-07-8	Endosulfan sulfate	79	U
72-20-8	Endrin	79	U
7421-93-4	Endrin Aldehyde	79	U
76-44-8	Heptachlor	20	U
1024-57-3	Heptachlor Epoxide	250	DE
72-43-5	Methoxychlor	200	U
8001-35-2	Toxaphene	2000	U
12674-11-2	Aroclor-1016	1500	U
11104-28-2	Aroclor-1221	2000	U
11141-16-5	Aroclor-1232	1500	U
53469-21-9	Aroclor-1242	1100	U
12672-29-6	Aroclor-1248	1100	U
11097-69-1	Aroclor-1254	1100	U
11096-82-5	Aroclor-1260	1500	U
53494-70-5	Endrin Ketone	200	U
5103-74-2	gamma-Chlordane	20	U
5103-71-9	alpha-Chlordane	40	U

JB use only this result 12A 3/28/03

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB33B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/08/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.0	U UJ, m
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	6.0	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U UJ, m
33213-65-9	Endosulfan II	4.0	U
1031-07-8	Endosulfan sulfate	4.0	U
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	1.9	P J, g
72-43-5	Methoxychlor	10	U
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	78	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	78	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Aroclor-1254	54	U
11096-82-5	Aroclor-1260	78	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.0	U

3C EXTRACTABLE PRIORITY POLLUTANT DATA SHEET

EPA SAMPLE NO.

54SB25A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	86	P J,C
85-01-8	Phenanthrene	23	J
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	90	
218-01-9	Chrysene	32	
205-99-2	Benzo(b)fluoranthene	35	
207-08-9	Benzo(k)fluoranthene	57	P J,Q
53-70-3	Dibenzo(a,h)anthracene	19	P
191-24-2	Benzo(g,h,i)perylene	28	
56-55-3	Benzo(a)anthracene	32	
50-32-8	Benzo(a)pyrene	58	
193-39-5	Indeno(1,2,3-cd)pyrene	38	
208-96-8	Acenaphthylene	51	U

AMENDED DATA

3C EXTRACTABLE [illegible] ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB25B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	590	P J/g
83-32-9	Acenaphthene	160	P J
86-73-7	Fluorene	52	U
129-00-0	Pyrene	12	J J,C
85-01-8	Phenanthrene	52	U
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	18	JP J/g
218-01-9	Chrysene	7.5	J
205-99-2	Benzo(b)fluoranthene	6.8	J
207-08-9	Benzo(k)fluoranthene	7.4	JP J/g
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	6.6	J
50-32-8	Benzo(a)pyrene	8.0	J
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	52	U

AMENDED DATA

1C EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB27A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/21/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	6700	EP J/J
83-32-9	Acenaphthene	1600	EP ✓
86-73-7	Fluorene	49	U
129-00-0	Pyrene	180	JPZ J/J
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.6	U
205-99-2	Benzo(b)fluoranthene	110	JPZ J/J
207-08-9	Benzo(k)fluoranthene	9.6	U
53-70-3	Dibenzo(a,h)anthracene	9.6	U
191-24-2	Benzo(g,h,i)perylene	9.6	U
56-55-3	Benzo(a)anthracene	9.6	U
50-32-8	Benzo(a)pyrene	9.6	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.6	U
208-96-8	Acenaphthylene	1100	PZ J/J

Z (Results reported with a twenty fold dilution)

FORM I PEST

AMENDED DATA

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3C EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB27B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	13	JP JC
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	21	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

AMENDED DATA

1C SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

S4SB28A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	210	
83-32-9	Acenaphthene	33	J
86-73-7	Fluorene	50	U
129-00-0	Pyrene	13	J JJC
85-01-8	Phenanthrene	19	J
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	28	
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	9.9	U
207-08-9	Benzo(k)fluoranthene	9.9	U
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	3.6	J
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	50	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB28B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	52	U
83-32-9	Acenaphthene	52	U
86-73-7	Fluorene	52	U
129-00-0	Pyrene	21	U
85-01-8	Phenanthrene	52	U
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	21	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	52	U

EPA SAMPLE NO.

3B SEMIVOLATILE TARGET COMPOUND DATA SHEET

54SB29A

Lab Name: COMPUCHEM Contract: 3310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	50	U
83-32-9	Acenaphthene	50	U
86-73-7	Fluorene	50	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	50	U
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	5.4	JP JG
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	9.9	U
207-08-9	Benzo(k)fluoranthene	9.9	U
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	9.9	U
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	30	JP JG

FORM I PEST

AMENDED DATA

SEMIVOLATILE ORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB29B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	53	U
83-32-9	Acenaphthene	53	U
86-73-7	Fluorene	53	U
129-00-0	Pyrene	13	JP J,C
85-01-8	Phenanthrene	53	U
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	22	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	53	U

AMENDED DATA

1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB30A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	9400	Z
83-32-9	Acenaphthene	210	PJ/g
86-73-7	Fluorene	49	U
129-00-0	Pyrene	67	JZ
85-01-8	Phenanthrene	120	JPZJ/g
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	49	
205-99-2	Benzo(b)fluoranthene	9.6	U
207-08-9	Benzo(k)fluoranthene	46	
53-70-3	Dibenzo(a,h)anthracene	9.6	U
191-24-2	Benzo(g,h,i)perylene	9.6	U
56-55-3	Benzo(a)anthracene	49	
50-32-8	Benzo(a)pyrene	9.6	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.6	U
208-96-8	Acenaphthylene	260	JPZ J/g

Z (Results reported with a ten fold dilution)

FORM I PEST

AMENDED DATA

SW EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB30B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	63	P J,J
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	9.9	J J,C
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	21	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

AMENDED DATA

EPA SAMPLE NO.

54SB31A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	53	U
83-32-9	Acenaphthene	53	U
86-73-7	Fluorene	53	U
129-00-0	Pyrene	27	P JIC
85-01-8	Phenanthrene	53	U
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	39	P J/g
218-01-9	Chrysene	13	
205-99-2	Benzo(b)fluoranthene	13	
207-08-9	Benzo(k)fluoranthene	9.2	JP J/g
53-70-3	Dibenzo(a,h)anthracene	34	P
191-24-2	Benzo(g,h,i)perylene	21	P ↓
56-55-3	Benzo(a)anthracene	15	
50-32-8	Benzo(a)pyrene	21	
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	53	U

AMENDED DATA

1D

3C EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB31B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	720	P K/S
83-32-9	Acenaphthene	16000	EP
86-73-7	Fluorene	51	U
129-00-0	Pyrene	320	K/S
85-01-8	Phenanthrene	230	
120-12-7	Anthracene	37	JP
206-44-0	Fluoranthene	620	EP
218-01-9	Chrysene	120	
205-99-2	Benzo(b)fluoranthene	150	P
207-08-9	Benzo(k)fluoranthene	200	P
53-70-3	Dibenzo(a,h)anthracene	62	
191-24-2	Benzo(g,h,i)perylene	130	P
56-55-3	Benzo(a)anthracene	160	
50-32-8	Benzo(a)pyrene	150	P
193-39-5	Indeno(1,2,3-cd)pyrene	94	P
208-96-8	Acenaphthylene	46	JP

AMENDED DATA

1E
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB32A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	480	
83-32-9	Acenaphthene	460	P JG
86-73-7	Fluorene	51	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

AMENDED DATA

3C

3C EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB32B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-13

Sample wt/vol: 30.0 g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	2500	EP J,J
83-32-9	Acenaphthene	600	P ↓
86-73-7	Fluorene	50	U
129-00-0	Pyrene	27	J,C
85-01-8	Phenanthrene	50	U
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	41	
218-01-9	Chrysene	56	
205-99-2	Benzo(b)fluoranthene	38	P J,J
207-08-9	Benzo(k)fluoranthene	32	P ↓
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	39	P J,J
50-32-8	Benzo(a)pyrene	24	P ↓
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	380	P J,J

AMENDED DATA

LD

3C EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB33A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	700	P J/g
83-32-9	Acenaphthene	520	P ↓
86-73-7	Fluorene	51	U
129-00-0	Pyrene	37	JPZ J/g
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	25	JPZ J/g
218-01-9	Chrysene	210	PZ ↓
205-99-2	Benzo(b)fluoranthene	17	
207-08-9	Benzo(k)fluoranthene	14	
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	11	JZ
56-55-3	Benzo(a)anthracene	10	J
50-32-8	Benzo(a)pyrene	17	P J/g
193-39-5	Indeno(1,2,3-cd)pyrene	390	EP ↓
208-96-8	Acenaphthylene	51	U

Z (Results reported with a two fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB33B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	100	J,m
83-32-9	Acenaphthene	59	
86-73-7	Fluorene	51	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	2.0	J
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB34A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	46	JP L,S
83-32-9	Acenaphthene	51	U P L,S
86-73-7	Fluorene	51	U ↓
129-00-0	Pyrene	17	JP L,S
85-01-8	Phenanthrene	51	U P L,S
120-12-7	Anthracene	51	U ↓
206-44-0	Fluoranthene	12	J L,S
218-01-9	Chrysene	4.6	JP ↓
205-99-2	Benzo(b)fluoranthene	10	U P L,S
207-08-9	Benzo(k)fluoranthene	10	U ↓
53-70-3	Dibenzo(a,h)anthracene	10	U ↓
191-24-2	Benzo(g,h,i)perylene	10	U ↓
56-55-3	Benzo(a)anthracene	3.6	J L,S
50-32-8	Benzo(a)pyrene	10	U P L,S
193-39-5	Indeno(1,2,3-cd)pyrene	10	U ↓
208-96-8	Acenaphthylene	51	U ↓
90-12-0	1-Methylnaphthalene	51	U ↓
91-57-6	2-Methylnaphthalene	51	U ↓

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB34B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 22 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	54	U
83-32-9	Acenaphthene	54	U
86-73-7	Fluorene	54	U
129-00-0	Pyrene	9.7	J
85-01-8	Phenanthrene	54	U
120-12-7	Anthracene	54	U
206-44-0	Fluoranthene	2.6	J
218-01-9	Chrysene	11	U
205-99-2	Benzo(b)fluoranthene	0.72	J
207-08-9	Benzo(k)fluoranthene	1.6	J
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	2.3	J
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	54	U

3C EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-8

Lab Name: COMPUCHEM Contract: 8310

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/09/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/22/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	830	PZ K/S
83-32-9	Acenaphthene	1200	PZ ↓
86-73-7	Fluorene	51	U
129-00-0	Pyrene	2100	E K/S
85-01-8	Phenanthrene	250	P
120-12-7	Anthracene	140	JZ
206-44-0	Fluoranthene	1600	E
218-01-9	Chrysene	690	Z
205-99-2	Benzo(b)fluoranthene	1300	
207-08-9	Benzo(k)fluoranthene	1800	EP
53-70-3	Dibenzo(a,h)anthracene	1300	EP
191-24-2	Benzo(g,h,i)perylene	900	PZ
56-55-3	Benzo(a)anthracene	540	E
50-32-8	Benzo(a)pyrene	1200	Z
193-39-5	Indeno(1,2,3-cd)pyrene	940	E
208-96-8	Acenaphthylene	190	JPZ ↓

Z (Results reported with a ten fold dilution)

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB25A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB25B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	2.7	J,C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.40	J
1946-51-0	4-Amino-2,6-dinitrotoluene	0.38	JP J,8
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB27A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted: 12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	6.8	J J,C
99-35-4	1,3,5-Trinitrobenzene	7.6	J
121-82-4	RDX	10	U
99-65-0	1,3-Dinitrobenzene	10	U
118-96-7	2,4,6-Trinitrotoluene	130	J,C
479-45-8	Tetryl	20	U
98-95-3	Nitrobenzene	10	U
121-14-2	2,4-Dinitrotoluene	17	
606-20-2	2,6-Dinitrotoluene	11	
35572-78-2	2-Amino-4,6-dinitrotoluene	5.7	J
1946-51-0	4-Amino-2,6-dinitrotoluene	5.2	J
88-72-2	2-Nitrotoluene	10	U
99-99-0	4-Nitrotoluene	10	U
99-08-1	3-Nitrotoluene	10	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB27B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/17/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB28A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB28B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB29A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB29B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB30A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.4	J,C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB30B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB31A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB31B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB32A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	3.1	J,C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.1	
1946-51-0	4-Amino-2,6-dinitrotoluene	0.76	J
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB32B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.8	
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	24	JC
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	0.40	J
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.5	
1946-51-0	4-Amino-2,6-dinitrotoluene	1.2	
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB33A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB33B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U UJ,M
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB34A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	0.43	J JC
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB34B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB35A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-8

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/18/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB25A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB25B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB27A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB27B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB28A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB28B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB29A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB29B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/19/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB30A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB30B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB31A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB31B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB32A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB32B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	32	P J,g

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB33A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB33B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB34A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB34B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB35A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-8

Lab Name: COMPUCHEM Contract: 8332

Lab Code: COMPU Case No.: SAS No.: SDG No.: S2810

Matrix: (soil/water) SOIL Lab Sample ID: S2810-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/10/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/20/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB25A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-14

Level (low/med): LOW Date Received: 12/04/02

% Solids: 82.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	18000			P	
7440-36-0	Antimony	0.47	B	N*	P	J,K
7440-38-2	Arsenic	2.3			P	
7440-39-3	Barium	88.9		E	P	J,S
7440-41-7	Beryllium	0.79			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	3070		E	P	J,S
7440-47-3	Chromium	25.4		E	P	
7440-48-4	Cobalt	10.5		E	P	
7440-50-8	Copper	25.5		E	P	
7439-89-6	Iron	27200		E	P	
7439-92-1	Lead	15.4		*E	P	J,K
7439-95-4	Magnesium	3470		E	P	J,S
7439-96-5	Manganese	474		E	P	
7439-97-6	Mercury	0.062		N	CV	L,M
7440-02-0	Nickel	11.5		E	P	J,S
7440-09-7	Potassium	1330			P	
7782-49-2	Selenium	1.1		N	P	B,X
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	89.0	B		P	K,W
7440-28-0	Thallium	0.27	U	N	P	R,M
7440-62-2	Vanadium	52.0		E	P	J,S
7440-66-6	Zinc	57.1		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB25B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-15

Level (low/med): LOW Date Received: 12/04/02

% Solids: 81.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12700			P	
7440-36-0	Antimony	0.44	B	N*	P	J,K
7440-38-2	Arsenic	1.5			P	
7440-39-3	Barium	145		E	P	J,S
7440-41-7	Beryllium	0.95			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	3140		E	P	J,S
7440-47-3	Chromium	19.8		E	P	↓
7440-48-4	Cobalt	8.5		E	P	
7440-50-8	Copper	17.0		E	P	
7439-89-6	Iron	20400		E	P	↓
7439-92-1	Lead	67.3		*E	P	J,K
7439-95-4	Magnesium	4130		E	P	J,S
7439-96-5	Manganese	567		E	P	↓
7439-97-6	Mercury	0.54		N	CV	L,M
7440-02-0	Nickel	13.8		E	P	J,S
7440-09-7	Potassium	1080			P	
7782-49-2	Selenium	1.2		N	P	B,K
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	115	B		P	K,W
7440-28-0	Thallium	0.28	U	N	P	R,M
7440-62-2	Vanadium	27.7		E	P	J,S
7440-66-6	Zinc	79.8		*E	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB27A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-1

Level (low/med): LOW Date Received: 12/04/02

% Solids: 86.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10500			P	
7440-36-0	Antimony	0.38	B	N*	P	J,K
7440-38-2	Arsenic	2.0			P	
7440-39-3	Barium	169		E	P	J,S
7440-41-7	Beryllium	0.81			P	
7440-43-9	Cadmium	0.17	B		P	
7440-70-2	Calcium	2490		E	P	J,S
7440-47-3	Chromium	17.8		E	P	
7440-48-4	Cobalt	7.5		E	P	
7440-50-8	Copper	26.7		E	P	
7439-89-6	Iron	20600		E	P	↓
7439-92-1	Lead	142		*E	P	J,K
7439-95-4	Magnesium	2930		E	P	J,S
7439-96-5	Manganese	394		E	P	
7439-97-6	Mercury	0.24		N	CV	L,M
7440-02-0	Nickel	10.9		E	P	J,S
7440-09-7	Potassium	1070			P	
7782-49-2	Selenium	1.1		N	P	B,K
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	32.6	U		P	
7440-28-0	Thallium	0.26	U	N	P	R,M
7440-62-2	Vanadium	26.2		E	P	J,S
7440-66-6	Zinc	189		*E	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB27B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-2

Level (low/med): LOW Date Received: 12/04/02

% Solids: 82.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11100			P	
7440-36-0	Antimony	0.53	B	N*	P	J,K
7440-38-2	Arsenic	1.4			P	
7440-39-3	Barium	119		E	P	J,S
7440-41-7	Beryllium	0.77			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	1280		E	P	J,S
7440-47-3	Chromium	17.6		E	P	
7440-48-4	Cobalt	8.4		E	P	
7440-50-8	Copper	9.9		E	P	
7439-89-6	Iron	18500		E	P	
7439-92-1	Lead	7.0		*E	P	J,K
7439-95-4	Magnesium	3060		E	P	J,S
7439-96-5	Manganese	434		E	P	
7439-97-6	Mercury	0.026	B	N	CV	L,M
7440-02-0	Nickel	12.1		E	P	J,S
7440-09-7	Potassium	909			P	
7782-49-2	Selenium	0.78		N	P	B,X
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	120	B		P	K,W
7440-28-0	Thallium	0.28	U	N	P	R,M
7440-62-2	Vanadium	27.7		E	P	J,S
7440-66-6	Zinc	55.7		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB28A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-3

Level (low/med): LOW Date Received: 12/04/02

% Solids: 84.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9460			P	
7440-36-0	Antimony	0.55	B	N*	P	J, K
7440-38-2	Arsenic	1.5			P	
7440-39-3	Barium	155		E	P	J, S
7440-41-7	Beryllium	0.80			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	1620		E	P	J, S
7440-47-3	Chromium	19.0		E	P	↓
7440-48-4	Cobalt	7.5		E	P	
7440-50-8	Copper	12.2		E	P	
7439-89-6	Iron	19400		E	P	↓
7439-92-1	Lead	67.6		*E	P	J, K
7439-95-4	Magnesium	2910		E	P	J, S
7439-96-5	Manganese	660		E	P	↓
7439-97-6	Mercury	0.038		N	CV	L, M
7440-02-0	Nickel	11.3		E	P	J, S
7440-09-7	Potassium	910			P	
7782-49-2	Selenium	1.2		N	P	B, L
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	33.2	U		P	
7440-28-0	Thallium	0.26	U	N	P	R, M
7440-62-2	Vanadium	22.9		E	P	J, S
7440-66-6	Zinc	164		*E	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB28B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-4

Level (low/med): LOW Date Received: 12/04/02

% Solids: 80.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11100			P	
7440-36-0	Antimony	0.30	B	N*	P	J,K
7440-38-2	Arsenic	1.3			P	
7440-39-3	Barium	136		E	P	J,S
7440-41-7	Beryllium	0.86			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	1510		E	P	J,S
7440-47-3	Chromium	18.1		E	P	
7440-48-4	Cobalt	8.7		E	P	
7440-50-8	Copper	11.6		E	P	
7439-89-6	Iron	19200		E	P	↓
7439-92-1	Lead	7.7		*E	P	J,K
7439-95-4	Magnesium	3390		E	P	J,S
7439-96-5	Manganese	519		E	P	↓
7439-97-6	Mercury	0.026	B	N	CV	L,M
7440-02-0	Nickel	12.5		E	P	J,S
7440-09-7	Potassium	1030			P	
7782-49-2	Selenium	0.86		N	P	B,X
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	101	B		P	K,W
7440-28-0	Thallium	0.28	U	N	P	R,M
7440-62-2	Vanadium	25.8		E	P	J,S
7440-66-6	Zinc	55.4		*E	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB29A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-5

Level (low/med): LOW Date Received: 12/04/02

% Solids: 84.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6740			P	
7440-36-0	Antimony	0.31	B	N*	P	J,K
7440-38-2	Arsenic	1.4			P	
7440-39-3	Barium	122		E	P	J,S
7440-41-7	Beryllium	0.63			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	1030		E	P	J,S
7440-47-3	Chromium	13.3		E	P	
7440-48-4	Cobalt	5.9		E	P	
7440-50-8	Copper	7.9		E	P	
7439-89-6	Iron	16600		E	P	
7439-92-1	Lead	52.2		*E	P	J,K
7439-95-4	Magnesium	2030		E	P	J,S
7439-96-5	Manganese	556		E	P	
7439-97-6	Mercury	0.037	B	N	CV	L,M
7440-02-0	Nickel	8.7		E	P	J,S
7440-09-7	Potassium	832			P	
7782-49-2	Selenium	0.96		N	P	B,C
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	34.3	U		P	
7440-28-0	Thallium	0.27	U	N	P	R,M
7440-62-2	Vanadium	17.5		E	P	J,S
7440-66-6	Zinc	176		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB29B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-6

Level (low/med): LOW Date Received: 12/04/02

% Solids: 79.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14300			P	
7440-36-0	Antimony	0.45	B	N*	P	L L
7440-38-2	Arsenic	1.7			P	
7440-39-3	Barium	179		E	P	J,S
7440-41-7	Beryllium	1.1			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	1870		E	P	J,S
7440-47-3	Chromium	24.3		E	P	
7440-48-4	Cobalt	9.3		E	P	
7440-50-8	Copper	12.1		E	P	
7439-89-6	Iron	23100		E	P	↓
7439-92-1	Lead	9.3		*E	P	J,K
7439-95-4	Magnesium	3830		E	P	J,S
7439-96-5	Manganese	578		E	P	↓
7439-97-6	Mercury	0.042		N	CV	L,M
7440-02-0	Nickel	15.1		E	P	J,S
7440-09-7	Potassium	819			P	
7782-49-2	Selenium	0.91		N	P	B,X
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	63.1	B		P	K,W
7440-28-0	Thallium	0.30	U	N	P	R,M
7440-62-2	Vanadium	32.9		E	P	J,S
7440-66-6	Zinc	74.4		*E	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB30A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-7

Level (low/med): LOW Date Received: 12/04/02

% Solids: 85.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10400			P	
7440-36-0	Antimony	0.34	B	N*	P	J/K
7440-38-2	Arsenic	1.2			P	
7440-39-3	Barium	133		E	P	J/S
7440-41-7	Beryllium	0.80			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	1470		E	P	J/S
7440-47-3	Chromium	18.1		E	P	
7440-48-4	Cobalt	8.9		E	P	
7440-50-8	Copper	12.3		E	P	
7439-89-6	Iron	18500		E	P	↓
7439-92-1	Lead	13.1		*E	P	J/K
7439-95-4	Magnesium	3090		E	P	J/S
7439-96-5	Manganese	524		E	P	↓
7439-97-6	Mercury	0.030	B	N	CV	L/M
7440-02-0	Nickel	11.7		E	P	J/S
7440-09-7	Potassium	1050			P	
7782-49-2	Selenium	0.72		N	P	B/K
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	72.2	B		P	K/W
7440-28-0	Thallium	0.26	U	N	P	R/M
7440-62-2	Vanadium	25.3		E	P	J/S
7440-66-6	Zinc	59.3		*E	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB30B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-8

Level (low/med): LOW Date Received: 12/04/02

% Solids: 82.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10200			P	
7440-36-0	Antimony	0.48	B	N*	P	J,K
7440-38-2	Arsenic	0.94	B		P	
7440-39-3	Barium	128		E	P	J,S
7440-41-7	Beryllium	0.75			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	1360		E	P	J,S
7440-47-3	Chromium	18.6		E	P	
7440-48-4	Cobalt	7.9		E	P	
7440-50-8	Copper	9.4		E	P	
7439-89-6	Iron	17800		E	P	↓
7439-92-1	Lead	8.0		*E	P	J,K
7439-95-4	Magnesium	3060		E	P	J,S
7439-96-5	Manganese	455		E	P	↓
7439-97-6	Mercury	0.032	B	N	CV	L,M
7440-02-0	Nickel	11.5		E	P	J,S
7440-09-7	Potassium	1030			P	
7782-49-2	Selenium	0.61	B	N	P	B,K
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	120	B		P	K,W
7440-28-0	Thallium	0.29	U	N	P	R,M
7440-62-2	Vanadium	25.7		E	P	J,S
7440-66-6	Zinc	52.9		*E	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB31A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-9

Level (low/med): LOW Date Received: 12/04/02

% Solids: 78.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15600			P	
7440-36-0	Antimony	0.48	B	N*	P	J,K
7440-38-2	Arsenic	2.5			P	
7440-39-3	Barium	89.1		E	P	J,S
7440-41-7	Beryllium	0.70			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	4610		E	P	J,S
7440-47-3	Chromium	29.5		E	P	
7440-48-4	Cobalt	8.9		E	P	
7440-50-8	Copper	12.0		E	P	
7439-89-6	Iron	24500		E	P	↓
7439-92-1	Lead	11.6		*E	P	J,K
7439-95-4	Magnesium	3780		E	P	J,S
7439-96-5	Manganese	407		E	P	↓
7439-97-6	Mercury	0.052		N	CV	L,M
7440-02-0	Nickel	9.4		E	P	J,S
7440-09-7	Potassium	1090			P	
7782-49-2	Selenium	1.0		N	P	B,X
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	110	B		P	K,W
7440-28-0	Thallium	0.28	U	N	P	R,M
7440-62-2	Vanadium	48.4		E	P	J,S
7440-66-6	Zinc	43.2		*E	P	↓

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB31B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-10

Level (low/med): LOW Date Received: 12/04/02

% Solids: 82.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12800			P	
7440-36-0	Antimony	0.36	B	N*	P	J,K
7440-38-2	Arsenic	1.9			P	
7440-39-3	Barium	82.3		E	P	J,S
7440-41-7	Beryllium	0.63			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	7890		E	P	J,S
7440-47-3	Chromium	19.9		E	P	
7440-48-4	Cobalt	9.7		E	P	
7440-50-8	Copper	15.3		E	P	
7439-89-6	Iron	22800		E	P	
7439-92-1	Lead	15.7		*E	P	J,K
7439-95-4	Magnesium	5640		E	P	J,S
7439-96-5	Manganese	552		E	P	
7439-97-6	Mercury	0.057		N	CV	L,M
7440-02-0	Nickel	9.2		E	P	J,S
7440-09-7	Potassium	1050			P	
7782-49-2	Selenium	1.1		N	P	B,K
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	119	B		P	K,W
7440-28-0	Thallium	0.28	U	N	P	R,M
7440-62-2	Vanadium	41.3		E	P	J,S
7440-66-6	Zinc	51.0		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB32A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-12

Level (low/med): LOW Date Received: 12/04/02

% Solids: 83.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12000			P	
7440-36-0	Antimony	0.52	B	N*	P	J, K
7440-38-2	Arsenic	1.4			P	
7440-39-3	Barium	148		E	P	J, S
7440-41-7	Beryllium	0.90			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	1550		E	P	J, S
7440-47-3	Chromium	20.9		E	P	
7440-48-4	Cobalt	9.2		E	P	
7440-50-8	Copper	20.2		E	P	
7439-89-6	Iron	20300		E	P	
7439-92-1	Lead	99.2		*E	P	J, K
7439-95-4	Magnesium	3510		E	P	J, S
7439-96-5	Manganese	512		E	P	
7439-97-6	Mercury	0.11		N	CV	L, M
7440-02-0	Nickel	13.5		E	P	J, S
7440-09-7	Potassium	1010			P	
7782-49-2	Selenium	1.0		N	P	B, K
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	347			P	K, W
7440-28-0	Thallium	0.27	U	N	P	R, M
7440-62-2	Vanadium	27.9		E	P	J, S
7440-66-6	Zinc	85.8		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB32B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-13

Level (low/med): LOW Date Received: 12/04/02

% Solids: 83.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9920			P	
7440-36-0	Antimony	0.61	B	N*	P	J, K
7440-38-2	Arsenic	1.3			P	
7440-39-3	Barium	146		E	P	J, S
7440-41-7	Beryllium	0.78			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	1760		E	P	J, S
7440-47-3	Chromium	24.4		E	P	
7440-48-4	Cobalt	7.9		E	P	
7440-50-8	Copper	21.6		E	P	
7439-89-6	Iron	17500		E	P	
7439-92-1	Lead	199		*E	P	J, K
7439-95-4	Magnesium	2950		E	P	J, S
7439-96-5	Manganese	520		E	P	
7439-97-6	Mercury	0.057		N	CV	L, M
7440-02-0	Nickel	11.4		E	P	J, S
7440-09-7	Potassium	1080			P	
7782-49-2	Selenium	0.98		N	P	B, K
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	111	B		P	K, W
7440-28-0	Thallium	0.28	U	N	P	R, M
7440-62-2	Vanadium	23.3		E	P	J, S
7440-66-6	Zinc	185		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB33A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-16

Level (low/med): LOW Date Received: 12/04/02

% Solids: 82.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11400			P	
7440-36-0	Antimony	0.49	B	N*	P	J,K
7440-38-2	Arsenic	1.1	B		P	
7440-39-3	Barium	163		E	P	J,S
7440-41-7	Beryllium	0.88			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	2130		E	P	J,S
7440-47-3	Chromium	20.0		E	P	
7440-48-4	Cobalt	7.8		E	P	
7440-50-8	Copper	19.6		E	P	
7439-89-6	Iron	18800		E	P	
7439-92-1	Lead	405		*E	P	J,K
7439-95-4	Magnesium	3240		E	P	J,S
7439-96-5	Manganese	598		E	P	
7439-97-6	Mercury	0.31		N	CV	L,M
7440-02-0	Nickel	13.0		E	P	J,S
7440-09-7	Potassium	1220			P	
7782-49-2	Selenium	0.52	B	N	P	B,L
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	327			P	K,W
7440-28-0	Thallium	0.28	U	N	P	R,M
7440-62-2	Vanadium	26.0		E	P	J,S
7440-66-6	Zinc	151		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB33B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-17

Level (low/med): LOW Date Received: 12/04/02

% Solids: 82.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10700			P	
7440-36-0	Antimony	4.8		N*	P	J, K
7440-38-2	Arsenic	1.4			P	
7440-39-3	Barium	148		E	P	J, S
7440-41-7	Beryllium	0.85			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	1720		E	P	J, S
7440-47-3	Chromium	18.9		E	P	
7440-48-4	Cobalt	8.2		E	P	
7440-50-8	Copper	18.3		E	P	
7439-89-6	Iron	18700		E	P	
7439-92-1	Lead	155		*E	P	J, K
7439-95-4	Magnesium	3230		E	P	J, S
7439-96-5	Manganese	534		E	P	
7439-97-6	Mercury	0.22		N	CV	L, M
7440-02-0	Nickel	12.1		E	P	J, S
7440-09-7	Potassium	1080			P	
7782-49-2	Selenium	0.75		N	P	B, Z
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	525			P	
7440-28-0	Thallium	0.29	U	N	P	R, M
7440-62-2	Vanadium	25.7		E	P	J, S
7440-66-6	Zinc	102		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB34A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-18

Level (low/med): LOW Date Received: 12/04/02

% Solids: 83.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	8520			P	
7440-36-0	Antimony	0.76	B	N*	P	J,K
7440-38-2	Arsenic	1.4			P	
7440-39-3	Barium	154		E	P	J,S
7440-41-7	Beryllium	0.70			P	
7440-43-9	Cadmium	0.45	B		P	
7440-70-2	Calcium	2190		E	P	J,S
7440-47-3	Chromium	16.8		E	P	
7440-48-4	Cobalt	6.7		E	P	
7440-50-8	Copper	84.1		E	P	
7439-89-6	Iron	18000		E	P	
7439-92-1	Lead	528		*E	P	J,K
7439-95-4	Magnesium	2960		E	P	J,S
7439-96-5	Manganese	561		E	P	
7439-97-6	Mercury	0.043		N	CV	L,M
7440-02-0	Nickel	10.3		E	P	J,S
7440-09-7	Potassium	1440			P	
7782-49-2	Selenium	0.99		N	P	B,X
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	33.5	U		P	
7440-28-0	Thallium	0.26	U	N	P	R,M
7440-62-2	Vanadium	20.4		E	P	J,S
7440-66-6	Zinc	337		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB34B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-19

Level (low/med): LOW Date Received: 12/04/02

% Solids: 78.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13100			P	
7440-36-0	Antimony	0.43	B	N*	P	J,K
7440-38-2	Arsenic	1.8			P	
7440-39-3	Barium	159		E	P	J,S
7440-41-7	Beryllium	1.0			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	1630		E	P	J,S
7440-47-3	Chromium	20.5		E	P	
7440-48-4	Cobalt	10.4		E	P	
7440-50-8	Copper	11.8		E	P	
7439-89-6	Iron	21800		E	P	
7439-92-1	Lead	9.5		*E	P	J,K
7439-95-4	Magnesium	3770		E	P	J,S
7439-96-5	Manganese	674		E	P	
7439-97-6	Mercury	0.035	B	N	CV	L,M
7440-02-0	Nickel	14.7		E	P	J,S
7440-09-7	Potassium	1150			P	
7782-49-2	Selenium	0.84		N	P	B,X
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	251			P	K,W
7440-28-0	Thallium	0.29	U	N	P	R,M
7440-62-2	Vanadium	29.7		E	P	J,S
7440-66-6	Zinc	65.3		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB35A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-20

Level (low/med): LOW Date Received: 12/04/02

% Solids: 83.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11800			P	
7440-36-0	Antimony	0.46	B	N*	P	J,K
7440-38-2	Arsenic	1.3			P	
7440-39-3	Barium	158		E	P	J,S
7440-41-7	Beryllium	0.88			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	1500		E	P	J,S
7440-47-3	Chromium	20.3		E	P	
7440-48-4	Cobalt	9.6		E	P	
7440-50-8	Copper	11.4		E	P	
7439-89-6	Iron	20100		E	P	
7439-92-1	Lead	9.6		*E	P	J,K
7439-95-4	Magnesium	3410		E	P	J,S
7439-96-5	Manganese	607		E	P	
7439-97-6	Mercury	0.044		N	CV	L,M
7440-02-0	Nickel	12.9		E	P	J,S
7440-09-7	Potassium	1160			P	
7782-49-2	Selenium	0.85		N	P	B,K
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	95.4	B		P	K,W
7440-28-0	Thallium	0.29	U	N	P	R,M
7440-62-2	Vanadium	29.3		E	P	J,S
7440-66-6	Zinc	65.6		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-8

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: S2810

Matrix (soil/water): SOIL Lab Sample ID: S2810-11

Level (low/med): LOW Date Received: 12/04/02

% Solids: 82.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	16600			P	
7440-36-0	Antimony	0.56	B	N*	P	J,K
7440-38-2	Arsenic	2.1			P	
7440-39-3	Barium	92.3		E	P	J,S
7440-41-7	Beryllium	0.75			P	
7440-43-9	Cadmium	0.030	U		P	
7440-70-2	Calcium	13800		E	P	J,S
7440-47-3	Chromium	24.4		E	P	
7440-48-4	Cobalt	10.9		E	P	
7440-50-8	Copper	14.7		E	P	
7439-89-6	Iron	25200		E	P	
7439-92-1	Lead	15.8		*E	P	J,K
7439-95-4	Magnesium	9290		E	P	J,S
7439-96-5	Manganese	484		E	P	
7439-97-6	Mercury	0.050		N	CV	L,M
7440-02-0	Nickel	11.7		E	P	J,S
7440-09-7	Potassium	1540			P	
7782-49-2	Selenium	0.69		N	P	B,K
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	117	B		P	K,W
7440-28-0	Thallium	0.28	U	N	P	R,M
7440-62-2	Vanadium	50.8		E	P	J,S
7440-66-6	Zinc	55.8		*E	P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 3/10/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: 52810
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

collected	extracted	analyzed	
12/3/02	12/9/02	12/14/02	12/13/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes: EQB-11 in R2810

bis(2-ethylhexyl)ph at 10 ug/L pos<10x→B,x

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes: See attached

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓
	1 or more <10% / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high Positives: L / J / L / K Non-detects: R / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 2,4-dimethylphenol 73% & 43% RPD

ND in 545B33B no flag ✓

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

545831B	D-8	RPD	545831B	D-8
2,6-DNT 40	400 U OK ✓	bis(2-ethyl-	140	140 OK ✓
2,4-DNT 76	400 U OK ✓	acenaphthylene	400 U	120 OK ✓
diethylphthalate 140	400 U OK ✓	common phenanthrene		51 OK ✓
n-nitrosodiphenylamine 30	400 U OK ✓	anthracene		51 OK →
di-n-butyl phthalate 130	36 (113%)	fluoranthene		270 OK ✓

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".	✓		

Notes:

2,6-Dinitrotoluene, 2,4-dinitrotoluene "E" in 545827A

use result from DF=4

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 20			
12.1.2	Number of target compounds in each analysis: 65			
12.1.3	Number of results rejected and not reported: 8			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 99%			

Notes:

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 3/10/03
DV Level: II (III) IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: S2810
Test Name: PEST
Method No.: 8081A

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?			
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?			
1.4	Do sample preservation, collection and storage condition meet method requirement?			
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?			
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes: Sample 545B33A was listed on COC but not analyzed.

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: Collected 12/3/02 Extracted 12/8/02 analyzed 12/17/02, 12/14/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		

3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes: IN SDG R2810 NDV

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		

Notes:

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?			✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?			✓

	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.			
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?			
5.4	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			
5.5	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).			
5.6	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	✓		
5.7	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	✓		
5.8	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	✓		

Notes:

6.0 Surrogate Recovery					**Yes**	**No**	**NA**
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?				✓		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.				✓		
6.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?					✓	
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?				✓		
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)				✓		
	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance			
	1 out	high/low	No action	No action			
	2 out	2 high same column	K	No action			

		2 low same column	L, UL	No action
		mixed same column	J, UJ	No action
		2 high diff columns	J	Not applicable
		2 low diff columns	J, UJ	Not applicable
		mixed diff columns	Professional judgement	Not applicable
	3 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		2 high, 1 low	K (2 high)	J (1 low 2nd column)
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
		other mixed	J, UJ	Not applicable
	4 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		Mixed	J, UJ	Not applicable
	If any recovery is >0% and <10% then L(+)/R(-).			
	If any recovery is 0% then R(+/-).			

Notes: 545B32BDL Tetrachloro-m-xylene 420 > 135 %. OK DF=20
545B32B " 1687 43-135 no action one failure
545B25B " (6%) and 685 % (R, S all)
545B25B surrogates diluted out OK since DF=50 & 10

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: beta-BHC (1250/1500) > 50-150 OK Sample conc. > 4x Spike amt.
endosulfan I MS (45) < 50-150 W,M in 545B33B
RPD 46 > 40%. Methoxychlor ND in ✓ no action

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: 414-DDT 160 > 50-150
POS → J, 8

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		✓	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes: J/8 unless prev. flagged
also several exceeded criteria "E" 4DD diluted results

11.0 Pesticide Cleanup Checks (Required when any positive result is reported > 38 ug/Kg for soils)		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)		✓	
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?		✓	
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			✓

Notes: heptachlor epoxide 53 ug/kg 545B30A, 200 in 545B32B Not Performed
endosulfan sulfate, heptachlor epoxide in 545B32A

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 7			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported:			
12.1.4	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100			

Notes:

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RA
Date: 3/5/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: 52810
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

	collected	extracted	analyzed
	12/3/02	12/9/02	12/20/02, 12/2/02, 12/24/02
	7	6	12/19/02, 12/22/26/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: EQB-11 in R2910 NDV

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: See attached POS J,C-

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		✓	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: D-8 P-terphenyl 820 %) 120 POS → K/S
545B34A 46 <50 L,UL,S
545B31B 230 %QC POS K/S

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: naphthalene 31/44 < QC J,m in Parent 545B33B
also several RPD failures → all ND in parent.
no flag?

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		✓	

Notes: D-8 545B31B

results for all except naphthalene and phenanthrene outside QC limit. Comment

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

several 740's → J/q unless prev. (consult chief if flag?)

10.0 Data Completeness		**Yes**	**No**	**NA**
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			
	% Completeness = 100 %.			

Notes:

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 3/11/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: 52810
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes: collect 12/3/02 extract 12/10/02 analyzed 12/18/02, 12/20/02, 12/17/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: EB in R2810 NDV

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: See attached POS J,C
no flag to ND since acceptable on the other column.

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			(
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: Tetrul MS/MSD 43/43 < 50-150
W,M in 545B33B parent.

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: D-8 545B31B
all ND all ND

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

4-amino-2,6-dinitrotoluene in 545B25B (41.7%) → J/g

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:			
10.1.3	Number of results rejected and not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: AJ
Date: 02/06/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: S2810
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: Cooler temps: 2.0°C, 2.0°C, 2.0°C

sampled: 12/03/02,
extracted: 12/10/02
analysis: 12/20/02, 12/19/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		X

Notes: No field /equipment blanks in this data package EA
in SDG R2810 ND ✓ RA

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).	X		
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		X	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		X	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.		X	
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: % Recovery for confirmation column for sample 545B27A was outside of upper control limit (150%) at 292%. All associated sample results were ND, so no action was taken.

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits? 93, 91		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits? 2		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS/MSD on sample 545833B

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present? Reported on Form I.		X	
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits? 93%.		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: NO LCSD

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.	X		

Notes: D-8 = 545331B – Both N.D.

32D

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	X		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes: 545B32B detected confirmed on 12/23

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: ø			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: S2810
Project No.: 15291524.00000

Project Name: Radford SWMU 54
Reviewer: RA
Date: 3/6/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: collect 12/3/02 — analyzed 12/15/16/02 ICP; 12/11/02 Hg

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%?		✓				
	<50% 50%-89% >110% 2xCRDL>|sample|>IDL L(+)/R(-) L(+)/UL(-) K						

Note:

CV 89.2 all >2x CRDL, no flag
Iron 113 " " " "
Lead 69.7 " " " "
Potassium 63.4 " " " "
Se 141.8 all prev. pos. in field blank.
Sodium 112.3 pos KIW
Tl 69.2 all ND, MB contamination.
Zinc 67.8 all >2x CRDL, no action

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B					✓	
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L						
4.5	Are there reported field blankor trip blank values > ± MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						

EQB-11 Se 3.4 ug/L <5X B, Zn in all samples

Note: MB-Ca -5.31 mg/kg Fe 2.469 Ni .144 Zn -.415 all <5X no flag | ICB, CCB, Pos, antimony, Fe, Mg, neg, Ca, lead, thallium, zinc all <5X no flag

all "R/m" 4 no/low flags in all — no action

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓	✓		✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.		✓		✓		

Note: antmony 165.7 pos J1K
lead 97.9

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓	✓	
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L						
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	✓			✓		✓

Note: antimony 27.7/28 all pos, prev flagged for lab dup.
Hg 44.3/22.2 all pos → J,m
Tl -92.4/-66.4 all ND → R,m

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note: see attached
Pos Js unless PRN.

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		✓		✓		

Note: Ca, Mg, K ✓ 37%
54% 46%
comment

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓		
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note:

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples: 20						
13.1.2	Number of target compounds in each analysis: 23						
13.1.3	Number of results rejected and not reported: 20						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 95%						

Note:

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1090

Project Number	Project Name
07604-310	RFAAP

Project Contact (Name and Phone Number): Duncan Rowe

Samplers: Fisher/Spagher

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545627A	12/3/02 1030	5		X	S	E		2		X	X			X		X							Explosives including
545B27B	12/3/02 1040	5		X	S	E		2		X	X			X		X							Nitroglycerin
545B28A	12/3/02 1045	5		X	S	E		2		X	X			X		X							
545B28B	12/3/02 1055	5		X	S	E		2		X	X			X		X							
545B29A	12/3/02 1115	5		X	S	E		2		X	X			X		X							
545B29B	12/3/02 1125	5		X	S	E		2		X	X			X		X							
545B30A	12/3/02 1130	5		X	S	E	3	3		X	X	X	X	X		X							
545B30B	12/3/02 1140	5		X	S	E	3	3		X	X	X	X	X		X							
545B31A	12/3/02 1215	5		X	S	E		2		X	X			X		X							
545B31B	12/3/02 1225	5		X	S	E		2		X	X			X		X							
D-8	12/3/02	5		X	S	E		2		X	X			X		X							
545B32A	12/3/02 1245	5		X	S	E	3	3		X	X	X	X	X		X							
545B32B	12/3/02 1255	5		X	S	E	3	3		X	X	X	X	X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. (Soil) Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
[signature] 12/5/02	1800				
Relinquished by:	Date/time	Received by: (for lab) Jacqueline Daily	Date/Time 12/4/02 9:00a.m.	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	
5					

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1089

Project Number	Project Name
09604.310	RFAAP

Project Contact (Name and Phone Number): Darren Rena

Samplers: Fisher / Spangler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B35A	12/3/02 1315	5		X	S	E		3		X	X	X	X	X		X							Explosives includes
545B35B	12/3/02 1325	5		X	S	E		3		X	X	X	X	X		X							Nitro Glycerin
545B33BMS	12/3/02 1325	5		X	S	E		3		X	X	X	X	X		X							
545B35BMSD	12/3/02 1325	5		X	S	E		3		X	X	X	X	X		X							
545B34A	12/3/02 1345	5		X	S	E		2		X	X			X		X							
545B34B	12/3/02 1355	5		X	S	E		2		X	X			X		X							
545B35A	12/3/02 1410	5		X	S	E		1		~~X~~	~~X~~			X		X							Metals/Explosives only
545B35B	12/3/02 1420	5		X	S	E		1		~~X~~	~~X~~			X		X							Metals/Explosives only
545B36A	12/3/02 1430	5		X	S	E		1						X		X							"
545B36B	12/3/02 1440	5		X	S	E		1						X		X							"
D-9	12/3/02	5		X	S	E		1						X		X							"
545B37A	12/3/02 1450	5		X	S	E		1						X		X							
545B37B	12/3/02 1500	5		X	S	E		1						X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. (Soil) Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	12/3/02 1800				
Relinquished by:	Date/time	Received by: (for lab) Marcine J. Baby	Date/Time 12/4/02 9:00am.	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Temp 2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1091

Project Number	Project Name
07604.310	RFAAP

Project Contact (Name and Phone Number): Darren Rempe

Samplers: Fisher / Spangler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B22A	12/3/02 845	5		X	5	E		2		X	X			X		X							Explosives Including
545B22B	12/3/02 855	5		X	5	E		2		X	X			X		X							Nitro Glycerin
545B23A	12/3/02 900	5		X	5	E		2		X	X			X		X							
545B23B	12/3/02 910	5		X	5	E		2		X	X			X		X							
545B23BMS	12/3/02 910	5		X	5	E		2		X	X			X		X							
545B23BMSD	12/3/02 910	5		X	5	E		2		X	X			X		X							
545B24A	12/3/02 925	5		X	5	E		2		X	X			X		X							
545B24B	12/3/02 935	5		X	5	E		2		X	X			X		X							
545B25A	12/3/02 950	5		X	5	E	3	3		X	X	X	X	X		X							
545B25B	12/3/02 1000	5		X	5	E	3	3		X	X	X	X	X		X							
545B26A	12/3/02 1010	5		X	5	E		2		X	X			X		X							
545B26B	12/3/02 1020	5		X	5	E		2		X	X			X		X							
D-7	12/3/02	5		X	5	E		2		X	X			X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	12/5/02 1800				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time		
		[signature]	12/4/02		

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

Temp: 2.0°C

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: _____T2810_____ **Fraction:** _SVOCs, PAH, Explosives,Nitroglycerin, Metals

Lab: _CompuChem_____ **Project Name:** __Radford SWMU 54_____

Reviewer: _____RA, AJ_____ **Date:** _____April 4, 2003_____

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the SVOC analyses, the initial calibration analyzed on 12/17/02 displayed a %RSD greater than the control limit (i.e., 15%) for atrazine at 86.73%. All associated sample results were non-detect and were flagged "R,r." The continuing calibration analyzed on 12/18/02 displayed a %D greater than the QC limit (i.e., 20%) with a negative bias for atrazine at 65.94%. The continuing calibration analyzed on 12/22/02 displayed a %D greater than the QC limit with a negative bias for atrazine at 68.21%. The continuing calibration analyzed on 12/23/02 displayed a %D greater than the QC limit with a negative bias for atrazine at 51.151%. The continuing calibration analyzed on 1/2/03 displayed a %D greater than the QC limit with a negative bias for atrazine at 76.69%. All associated sample results were previously flagged due to initial calibration anomalies and no further data qualifying action was required.

The extraction holding time was grossly exceeded for sample 54SB46CRE. All associated sample results were non-detect and were flagged "R,h."

The recoveries for all surrogates were less than the lower QC limits at 0% in sample 54SB46C. Positive results were flagged "L,s" and non-detects were flagged "R,s." The surrogate recoveries were acceptable in sample 54SB46CRE. However, the results for this sample were rejected due to holding time anomalies.

The recoveries for all surrogates were less than the lower QC limits at 3% in sample 54SB46A. Non-detects were flagged "R,s." Positive results were previously flagged "L,h" due to holding time anomaly and no further data qualifying action was required. Five surrogate recoveries were less than the lower QC limits in sample 54SB46ADL (DF=15). No data qualifying action was required since the dilution factor is greater than 10 and the results from dilution analysis should be used for this sample.

The LCS extracted on 1/2/03 displayed a recovery for benzaldehyde (7%) which was less than the lower QC limit (i.e., 10%). All results were previously flagged "R,h" in the associated sample 54SB46CRE, and no further data qualifying action was required.

The percent completeness was less than the QC limit (i.e., 90%) at 84% due to these anomalies.

For the explosive analyses, the LCS recovery for 1,3,5-trinitrobenzene (24%) was less than the lower QC limit (i.e., 50%). Non-detects were flagged "R,l" in the associated samples.

For the metals analyses, the MS/MSD recoveries for antimony (28.8/27%) and copper (-6.8%/-21.5%), were less than the lower QC limit (i.e., 75%). Non-detects were flagged "R,m" in the associated samples.

Minor Anomalies: For the SVOC analyses, the extraction holding time was exceeded by one day in samples 54SB46A and 54SB46B. Positive results were flagged "L,h" and non-detects were flagged "UL,h" unless previously flagged due to other anomalies.

The initial calibration analyzed on 12/17/02 displayed %RSDs greater than the control limit (i.e., 15%) for benzaldehyde at 15.27%, hexachlorocyclopentadiene at 25.91%, 2,4,6-trichlorophenol at 15.39%, 2,4-dinitrophenol at 19.31%, 2,4-dinitrotoluene at 16.27%, 4-chlorophenyl-phenylether at 17.19%, 1,1-biphenyl at 15.11%, 3-nitroaniline at 15.92%, 4-nitrophenol at 18.39%, n-nitrosodiphenylamine at 17.90%, and benzo(k)fluoranthene at 18.29%. Positive results were flagged "J,r" unless previously flagged due to other anomalies. No data flags were applied to the non-detects since the failures were not serious enough (i.e., >50%) to affect the non-detects.

The CCV analyzed on 12/23/02 at 1110 displayed a %D greater than the control limit (i.e., 20%) with a negative bias for 2,4-dinitrophenol at 24.44%. Non-detects were flagged "UJ,c" in the associated samples.

The recoveries for all surrogates were less than the lower QC limits in sample 54SB46B. All results were previously flagged due to holding time anomalies and no further data qualifying action was required. The recoveries for all surrogates were less than the lower QC limits in sample 54SB46BDL. Positive results were flagged "L,s" and non-detects were flagged "UL,s", unless previously flagged due to other anomalies. The original sample results should be used for all compounds except diethylphthalate for data interpretation. The result from the dilution analysis should be used for diethylphthalate since the original result is outside the calibration range of the instrument.

The MSD and RPDs were outside the QC limits for 4-chloroaniline (1.1%/189%), 3-nitroaniline (15%/102%), 4-nitroaniline (32%/53%), and 3,3-dichlorobenzidine (2.1%/163%). Non-detects were flagged "UJ,m" for these compounds in the parent sample 54SB49A.

The LCS extracted on 12/11/02 displayed a recovery for atrazine (151%) which was greater than the upper QC limit. All associated field sample results were non-detects and were previously flagged due to an initial calibration anomaly. No further data qualifying action was required.

Diethylphthalate exceeded the calibration range of the instrument in several samples and was flagged "E" by the laboratory. These results were flagged "J,q." These samples were analyzed at different dilution factors with acceptable results and the results from dilution analysis should be used for this compound.

For the Pest/PCB analyses, the CCV analyzed on 12/24/02 at 1941 displayed a %D greater than the QC limit (i.e., 15%) with a positive bias for gamma-BHC (18.55%). The CCV analyzed on 12/27/02 at 2002 displayed %Ds greater than the QC limit with a positive bias for endosulfan sulfate (17.87%/16.26%), 4,4-DDT (16.72%), endrin aldehyde (25.27%), and endrin ketone (15.98%/19.64%). Positive results were flagged "J,c" in the associated samples.

The recoveries for surrogate tetrachloro-m-xylene (TCX) were outside the QC limits in samples 54SB46A (24%) and 54SB49ARE (143%). The recoveries for surrogate decachlorobiphenyl (DCB) were outside the QC limits in samples 54SB49A (191%) and 54SB46BRE (32%). No data qualifying action is required based on one surrogate failure and no data flags were applied. The recoveries for surrogate TCX in sample 54SB46B (330%/381%) were greater than the upper QC limit. Positive results were flagged "J,s" unless previously flagged due to other anomalies. The recoveries for surrogate DCB (170%/28%) and TCX (40%/28%) were outside the QC limits in sample 54SB46ARE. Positive results were flagged "J,s" and non-detects were flagged "UJ,s" unless previously flagged due to other anomalies.

One or both surrogate recoveries were outside the QC limits in samples 54SB46BDL (DF=100), 54SB46ADL (DF=10) and 54SB49ADL (DF=10). No data qualifying action is required since the dilution factors are equal to or greater than 10.

The MS and/or MSD recoveries for aldrin (548%/1428%), beta-BHC (0%/20000%), delta-BHC (274%/310%), 4,4-DDD (176%), 4,4-DDE (1154%/-36%), 4,4,-DDT (210%/357%), dieldrin (219%/176%), endosulfan I (3928%/3690%), endrin aldehyde (167%), heptachlor (583%/750%), heptachlor epoxide (-262%/-762%), methoxychlor (-14%), gamma-chlordane (500%) and alpha-chlordane (190%/381%) were outside the QC limits. Positive results were

flagged "J,m" and non-detects were flagged "UJ,m" in the parent sample, 54SB49A. The RPDs were greater than the QC limits for aldrin (89%), 4,4-DDT (52%), gamma-chlordane (111%) and alpha-chlordane (67%). No positive results were reported in the parent sample and no data qualifying action was required.

The LCS recoveries for 4,4-DDD (230%) and endosulfan II (160%) were greater than the upper QC limit. No positive results were reported and no data qualifying action was required.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for some compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

Several compounds exceeded the calibration range in several samples and were flagged "E" by the laboratory. These results were flagged "J,q". These samples were re-analyzed at different dilution factors with acceptable results and results from the dilution analyses should be used for the associated compounds.

For the PAH analyses, the CCV analyzed on 12/28/02 at 1122 displayed a %D greater than the QC limit (i.e., 15%) with a negative bias for benzo(k)fluoranthene at 15.04%. The CCV analyzed on 12/29/02 at 1012 displayed a %D greater than the QC limit with a negative bias for benzo(k)fluoranthene at 21.19%. All associated sample results were positive and were flagged "J,c."

The recovery for surrogate p-terphenyl was less than the lower QC limit (i.e., 50%) in sample 54SB44B. Positive results were flagged "L,s" and non-detects were flagged "UL,s" unless previously flagged due to other anomalies.

The MS and/or MSD recoveries were outside the QC limits for naphthalene (224%/341%), acenaphthene (41%/0%), benzo(b)fluoranthene (-69%/-67%), benzo(a)pyrene (28%), acenaphthylene (-76%/-76%), chrysene (42%), and benzo(a)anthracene (45%). The RPDs were outside the QC limits for acenaphthene (52%), fluorene (37%), phenanthrene (30%), anthracene (38%), fluoranthene (24%), chrysene (26%), benzo(k)fluoranthene (54%), dibenzo(a,h)anthracene (27%), benzo(g,h,i)perylene (27%), benzo(a)anthracene (55%), benzo(a)pyrene (72%), and indeno(1,2,3-cd)pyrene (28%). No data qualifying action was required for naphthalene since the sample result was greater than 4 times the spiking amount. Results associated with the MS/MSD anomalies were positive in the parent sample, 54SB49A, and were flagged "J,m." Positive results associated with RPD anomalies were flagged "J,d" in the parent sample, 54SB49A.

The RPDs between the primary and confirmation columns were greater than the QC limit (i.e., 40%) for some compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

For the explosives analyses, the continuing calibration analyzed on 12/28/02 at 1637 displayed %Ds greater than the QC limit (i.e., 15%) with a positive bias for 2,4,6-trinitrotoluene at 17.09% and 2,4-dinitrotoluene at 16.88%. The CCV analyzed on 12/29/02 at 0022 displayed a %D greater than the QC limit with a negative bias for 4-amino-2,6-dinitrotoluene at 16.29% and with a positive bias for 2,4,6-trinitrotoluene at 19.01% and 2,4-dinitrotoluene at 22.49%. The CCV analyzed on 1/3/03 at 0240 displayed a %D greater than the QC limit with a positive bias for 2,4,6-trinitrotoluene at 19.62%. The CCV analyzed on 1/8/03 at 1908 displayed a %D greater than the QC limit with a negative bias for 3-nitrotoluene at 27.97%. The CCV analyzed on 1/9/03 at 0539 displayed a %D greater than the QC limit with a negative bias for 3-nitrotoluene at 26.88%. Positive results were flagged "J,c" for the anomalies associated with positive biases and non-detects were flagged "UJ,c" for the anomalies associated with negative biases.

The MS and/or MSD recoveries were outside the QC limits for HMX (19%/43%), 1,3,5-trinitrobenzene (505%/-35%), 2,4,6-trinitrotoluene (2700%/-950%), and 2-amino-4,6-dinitrotoluene (153%). The RPDs were greater than the QC limits for HMX (76%), 1,3,5-trinitrobenzene (164%), 2,4,6-trinitrotoluene (78%), 2,4-dinitrotoluene (33%), 2,6-dinitrotoluene (43%), 4-amino-2,6-dinitrotoluene (67%), 2-nitrotoluene (33%), and 3-nitrotoluene (33%). Results for the compounds with MS/MSD anomalies were non-detects and were flagged "UJ,m" in the parent sample, 54SB49A. Results for the compounds with RPD anomalies were either non-detect or previously flagged and no further data qualifying action was taken.

The LCS recovery for 1,3,5-trinitrobenzene (24%) was less than the lower QC limit (i.e., 50%). Positive results were flagged "J,l" in the associated samples.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for some compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

Several compounds exceeded the calibration range of the instrument in several samples and were flagged "E" by the laboratory. These results were flagged "J,q" unless previously flagged due other anomalies.

For the nitroglycerin analyses, the recoveries for surrogate 1,4-dinitrobenzene (310%/47%) were outside the QC limits in sample 54SB46A. The positive sample result was flagged "J,s."

The continuing calibration analyzed on 1/5/03 at 1626 displayed a %D greater than the QC limit (i.e., 15%) with a positive bias for nitroglycerin at 17.27%. The

associated sample result was previously flagged due to a surrogate recovery anomaly and no further data qualifying action was required.

The MS/MSD recoveries (7100%/2900%) and the RPD (85%) were greater than the upper QC limit. The parent sample result in 54SB49A was a non-detect and no data qualifying action was required.

For the metal analyses, the method blank displayed positive results for barium, copper, magnesium and zinc and a negative result for beryllium. All associated sample results were positive and were greater than 5 times the absolute value of the blank concentration and no data qualifying action was required.

Equipment blanks EQB-11 and EQB-12 located in SDG R2810 contained selenium 3.4 ug/L and chromium at 0.67 ug/L, respectively. Positive results less than 5 times the blank concentration were flagged "B,x" in the associated samples.

The initial and continuing calibration blanks also contained a negative result for chromium and positive results for barium, calcium and magnesium. All associated sample results were positive and were greater than 5 times the absolute value of the blank concentration and no data qualifying action was required.

The initial CRDL percent recoveries for aluminum (114.2%), antimony (112.7%), arsenic (115.5%/79.8%), chromium (87.8%), copper (69.4%), lead (71.3%), nickel (130.4%) and sodium (78.6%/75.4%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "K,w" and non-detects were flagged "UL,w" for antimony and arsenic in the associated samples. All associated sample results were positive and were flagged "L,w" for sodium. All associated sample results were greater than 2xCRDL for the other analytes or were previously flagged and no further data qualifying action was required.

The laboratory duplicate results were greater than the QC limit (i.e., 35%) for antimony (200%), copper (67%), mercury (113%), lead (115.7%), and zinc (39.6%). Positive results were flagged "J,k" and non-detects were flagged "UJ,k" unless previously flagged due to other anomalies.

The MS/MSD pair for sample 54SB49A displayed recoveries for arsenic (68.6%/73.9%), chromium (74.2%), thallium (55.8%/59.7%), mercury (67.6%), selenium (38.6%/47.7%), and zinc (10.2%/18.5%). Positive results were flagged "L,m" and non-detects were flagged "UL,m" unless previously flagged due to other anomalies.

The %Ds for serial dilution analyses were greater than the QC limit (i.e., 10%) for barium (11.2%), calcium (14.5%), cobalt (14.2%), copper (21.8%), iron (13.3%), lead (14.4%), magnesium (13.5%), manganese (12.7%), nickel (12.1%),

potassium (13.4%), vanadium (10.1%) and zinc (15.9%). Positive results were flagged "J,s", unless previously flagged due to other anomalies.

Correctable Anomalies: None.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were elevated.

Positive TIC results were flagged "NJ,t" in the associated samples. Except for data flagged "R", all data, as qualified, are usable for their intended purpose based on the data reviewed.

Signed: Raycon

SAMPLENUM	CLIENTID	QUOTENUMREF	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
T2810-1	54SB35B	Q2810 1089	T2810	SO	URS	RADFORD SWMU 54	12/4/02
T2810-2	54SB36A	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/4/02
T2810-3	54SB36B	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/4/02
T2810-5	54SB37A	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/4/02
T2810-6	54SB37B	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/4/02
T2810-7	54SB38A	Q2810 1035	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-8	54SB38B	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-9	54SB43A	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-10	54SB43B	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-11	54SB43C	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-12	54SB44A	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-13	54SB44B	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-14	54SB44C	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-16	54SB46A	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-17	54SB46B	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-18	54SB46C	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-19	54SB49A	Q2810 1037	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-20	54SB49B	Q2810	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-15	D-11	Q2810 1035	T2810	SO	URS	RADFORD SWMU 54	12/6/02
T2810-4	D-9	Q2810 1089	T2810	SO	URS	RADFORD SWMU 54	12/4/02

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB43A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-9A64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	1200	
606-20-2	2,6-Dinitrotoluene	25	J
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB43A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-9A64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	150	J J,r
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	720	
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	160	J J,r
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R,r
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	970	
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	670	
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB43A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-9A64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 17

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.32	490	JB
2.		UNKNOWN (BC)	5.61	940	JB
3.		UNKNOWN	7.38	220	J
4.		UNKNOWN	12.26	620	J
5.	638-53-9	TRIDECANOIC ACID	12.68	170	NJ
6.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.04	850	NJ
7.	2765-11-9	PENTADECANAL-	19.59	530	NJ
8.		STRAIGHT-CHAIN ALKANE	19.88	210	J
9.		UNKNOWN	19.91	280	J
10.		STRAIGHT-CHAIN ALKANE	20.85	250	J
11.		UNKNOWN	21.23	1600	J
12.		UNKNOWN	21.38	760	J
13.		UNKNOWN	21.98	5000	J
14.	58-22-0	TESTOSTERONE	22.68	200	NJ
15.		UNKNOWN	22.92	160	J
16.		UNKNOWN	23.71	850	J
17.		UNKNOWN	24.23	1400	J
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB43B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-10A64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	750	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	750	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB43B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-10A64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	750	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	750	U
534-52-1	4,6-Dinitro-2-methylphenol	750	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U R,r
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB43B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-10A64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.32	~~420~~	~~JB~~
2.		UNKNOWN (BC)	~~5.60~~	930	JB
3.		~~UNKNOWN (BC)~~	6.91	190	JB
4.	1454-85-9	1-HEPTADECANOL	14.08	160	NJ NJ, E
5.					
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB43C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-11JB64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB43C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-11JB64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R IV
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB43C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-11JB64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.33~~	~~250~~	~~JB~~
2.		UNKNOWN (BC)	5.60	550	JB
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB44A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-12A64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	770	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	770	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB44A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-12A64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	770	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	74	J
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	770	U
534-52-1	4,6-Dinitro-2-methylphenol	770	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U R, r
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB44A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-12A64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.31	420	JB
2.		UNKNOWN (BC)	5.61	880	JB
3.		UNKNOWN (BC)	6.92	160	JB
4.		UNKNOWN	18.81	340	J
5.	56554-86-0	17-OCTADECENAL	19.59	540	NJ
6.	1454-84-8	1-NONADECANOL	19.92	500	NJ
7.	56554-87-1	16-OCTADECENAL	20.61	160	NJ
8.		STRAIGHT-CHAIN ALKANE	20.86	250	J
9.		UNKNOWN	20.91	990	J
10.		UNKNOWN	21.88	200	J
11.		UNKNOWN	22.06	710	J
12.	243-42-5	BENZO[B]NAPHTHO[2,3-D]FURAN	22.17	170	NJ
13.		UNKNOWN	22.28	460	J
14.	475-20-7	1,4-METHANOAZULENE, DECAHYDR	22.48	260	NJ
15.		UNKNOWN	22.69	770	J
16.		UNKNOWN	22.85	280	J
17.		UNKNOWN	22.91	230	J
18.		UNKNOWN	23.37	180	J
19.		UNKNOWN	23.45	250	J
20.		UNKNOWN	24.20	360	J
21.					
22.					
23.					
24.					
25.					
26.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB44B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-13B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB44B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-13B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	780	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U R,r
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	390	U
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB44B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-13B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/18/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.32~~	~~420~~	~~JB~~
2.		UNKNOWN (BC)	5.61	920	JB
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB44C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-14B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB44C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-14B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	130	J
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U R1V
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	390	U
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB44C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-14B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.31~~	~~360~~	~~JB~~
2.		UNKNOWN (BC)	5.61	810	JB
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-16RA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	130	J
606-20-2	2,6-Dinitrotoluene	170	J
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-16RA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	790	
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	8800	E
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	110	J
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	510	
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	160	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB46A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-16RA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	10.92	730	NJ
2.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.08	2800	NJ
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46ADL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-16DA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/23/02

Injection Volume: 1.0(uL) Dilution Factor: 15.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	6000	U
108-95-2	Phenol	6000	U
111-44-4	Bis(2-chloroethyl)ether	6000	U
95-57-8	2-Chlorophenol	6000	U
95-48-7	2-Methylphenol	6000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	6000	U
98-86-2	Acetophenone	6000	U
106-44-5	4-Methylphenol	6000	U
621-64-7	N-Nitroso-di-N-propylamine	6000	U
67-72-1	Hexachloroethane	6000	U
98-95-3	Nitrobenzene	6000	U
78-59-1	Isophorone	6000	U
88-75-5	2-Nitrophenol	6000	U
105-67-9	2,4-Dimethylphenol	6000	U
111-91-1	Bis(2-chloroethoxy)methane	6000	U
120-83-2	2,4-Dichlorophenol	6000	U
91-20-3	Naphthalene	6000	U
106-47-8	4-Chloroaniline	6000	U
87-68-3	Hexachlorobutadiene	6000	U
105-60-2	Caprolactam	6000	U
59-50-7	4-Chloro-3-methylphenol	6000	U
91-57-6	2-Methylnaphthalene	6000	U
77-47-4	Hexachlorocyclopentadiene	6000	U
88-06-2	2,4,6-Trichlorophenol	6000	U
95-95-4	2,4,5-Trichlorophenol	6000	U
92-52-4	1,1'-Biphenyl	6000	U
91-58-7	2-Chloronaphthalene	6000	U
88-74-4	2-Nitroaniline	12000	U
131-11-3	Dimethylphthalate	1900	DJ
606-20-2	2,6-Dinitrotoluene	2100	DJ
208-96-8	Acenaphthylene	6000	U
99-09-2	3-Nitroaniline	12000	U
83-32-9	Acenaphthene	6000	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46ADL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-16DA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted: 12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/23/02

Injection Volume: 1.0(uL) Dilution Factor: 15.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	30000	U UJ,C
100-02-7	4-Nitrophenol	12000	U
121-14-2	2,4-Dinitrotoluene	14000	D UJ,r
132-64-9	Dibenzofuran	6000	U
84-66-2	Diethylphthalate	96000	D
7005-72-3	4-Chlorophenyl-phenylether	6000	U
86-73-7	Fluorene	6000	U
100-01-6	4-Nitroaniline	12000	U
534-52-1	4,6-Dinitro-2-methylphenol	12000	U
86-30-6	N-Nitrosodiphenylamine (1)	1800	DJ UJ,r
101-55-3	4-Bromophenyl-phenylether	6000	U
118-74-1	Hexachlorobenzene	6000	U
1912-24-9	Atrazine	6000	U R,r
87-86-5	Pentachlorophenol	6000	U
85-01-8	Phenanthrene	6000	U
120-12-7	Anthracene	6000	U
86-74-8	Carbazole	6000	U
84-74-2	Di-n-butylphthalate	11000	D
206-44-0	Fluoranthene	6000	U
129-00-0	Pyrene	6000	U
85-68-7	Butylbenzylphthalate	6000	U
91-94-1	3,3'-Dichlorobenzidine	6000	U
117-81-7	bis(2-ethylhexyl)Phthalate	1400	DJ
56-55-3	Benzo(a)anthracene	6000	U
218-01-9	Chrysene	6000	U
117-84-0	Di-n-octylphthalate	6000	U
205-99-2	Benzo(b)fluoranthene	6000	U
207-08-9	Benzo(k)fluoranthene	6000	U
50-32-8	Benzo(a)pyrene	6000	U
193-39-5	Indeno(1,2,3-cd)pyrene	6000	U
53-70-3	Dibenzo(a,h)anthracene	6000	U
191-24-2	Benzo(g,h,i)perylene	6000	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB46ADL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-16DA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/23/02

Injection Volume: 1.0(uL) Dilution Factor: 15.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	10.90	8500	NJD MT
2.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.06	40000	NJD
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-17RA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U UL,h
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	1000	L,h
606-20-2	2,6-Dinitrotoluene	750	
208-96-8	Acenaphthylene	30	J
99-09-2	3-Nitroaniline	800	U UL,h
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-17RA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	4700	
132-64-9	Dibenzofuran	400	U
~~84-66-2~~	~~Diethylphthalate~~	~~12000~~	~~E~~
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	43	J
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	500	
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	250	J
120-12-7	Anthracene	58	J
86-74-8	Carbazole	42	J
84-74-2	Di-n-butylphthalate	3100	
206-44-0	Fluoranthene	400	J
129-00-0	Pyrene	380	J
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	1900	
56-55-3	Benzo(a)anthracene	180	J
218-01-9	Chrysene	220	J
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	290	J
207-08-9	Benzo(k)fluoranthene	220	J
50-32-8	Benzo(a)pyrene	190	J
193-39-5	Indeno(1,2,3-cd)pyrene	160	J
53-70-3	Dibenzo(a,h)anthracene	73	J
191-24-2	Benzo(g,h,i)perylene	150	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB46B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-17RA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/19/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	10.32	~~160~~	~~J~~
2.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	10.93	4600	NJ NJ
3.		~~UNKNOWN~~	~~12.29~~	~~840~~	~~J~~
4.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.10	5800	NJ NJ
5.		~~UNKNOWN~~	~~13.33~~	~~250~~	~~J~~
6.		~~UNKNOWN~~	17.21	190	J
7.	205-99-2	BENZ[E]ACEPHENANTHRYLENE	19.91	250	NJ NJ
8.		~~UNKNOWN~~	21.32	220	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46BDL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-17DA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/23/02

Injection Volume: 1.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	2000	U
108-95-2	Phenol	2000	U
111-44-4	Bis(2-chloroethyl)ether	2000	U
95-57-8	2-Chlorophenol	2000	U
95-48-7	2-Methylphenol	2000	U
108-60-1	2,2'-oxybis(1-Chloropropane)	2000	U
98-86-2	Acetophenone	2000	U
106-44-5	4-Methylphenol	2000	U
621-64-7	N-Nitroso-di-N-propylamine	2000	U
67-72-1	Hexachloroethane	2000	U
98-95-3	Nitrobenzene	2000	U
78-59-1	Isophorone	2000	U
88-75-5	2-Nitrophenol	2000	U
105-67-9	2,4-Dimethylphenol	2000	U
111-91-1	Bis(2-chloroethoxy)methane	2000	U
120-83-2	2,4-Dichlorophenol	2000	U
91-20-3	Naphthalene	2000	U
106-47-8	4-Chloroaniline	2000	U
87-68-3	Hexachlorobutadiene	2000	U
105-60-2	Caprolactam	2000	U
59-50-7	4-Chloro-3-methylphenol	2000	U
91-57-6	2-Methylnaphthalene	2000	U
77-47-4	Hexachlorocyclopentadiene	2000	U
88-06-2	2,4,6-Trichlorophenol	2000	U
95-95-4	2,4,5-Trichlorophenol	2000	U
92-52-4	1,1'-Biphenyl	2000	U
91-58-7	2-Chloronaphthalene	2000	U
88-74-4	2-Nitroaniline	4000	U
131-11-3	Dimethylphthalate	880	DJ
606-20-2	2,6-Dinitrotoluene	530	DJ
208-96-8	Acenaphthylene	2000	U
99-09-2	3-Nitroaniline	4000	U
83-32-9	Acenaphthene	2000	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46BDL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-17DA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/23/02

Injection Volume: 1.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	10000	U
100-02-7	4-Nitrophenol	4000	U
121-14-2	2,4-Dinitrotoluene	1400	DJ
132-64-9	Dibenzofuran	2000	U
84-66-2	Diethylphthalate	18000	D
7005-72-3	4-Chlorophenyl-phenylether	2000	U
86-73-7	Fluorene	2000	U
100-01-6	4-Nitroaniline	4000	U
534-52-1	4,6-Dinitro-2-methylphenol	4000	U
86-30-6	N-Nitrosodiphenylamine (1)	400	DJ
101-55-3	4-Bromophenyl-phenylether	2000	U
118-74-1	Hexachlorobenzene	2000	U
1912-24-9	Atrazine	2000	U
87-86-5	Pentachlorophenol	2000	U
85-01-8	Phenanthrene	180	DJ
120-12-7	Anthracene	2000	U
86-74-8	Carbazole	2000	U
84-74-2	Di-n-butylphthalate	3600	D
206-44-0	Fluoranthene	260	DJ
129-00-0	Pyrene	230	DJ
85-68-7	Butylbenzylphthalate	2000	U
91-94-1	3,3'-Dichlorobenzidine	2000	U
117-81-7	bis(2-ethylhexyl)Phthalate	3700	D
56-55-3	Benzo(a)anthracene	2000	U
218-01-9	Chrysene	2000	U
117-84-0	Di-n-octylphthalate	2000	U
205-99-2	Benzo(b)fluoranthene	2000	U
207-08-9	Benzo(k)fluoranthene	2000	U
50-32-8	Benzo(a)pyrene	2000	U
193-39-5	Indeno(1,2,3-cd)pyrene	2000	U
53-70-3	Dibenzo(a,h)anthracene	2000	U
191-24-2	Benzo(g,h,i)perylene	2000	U

Use only this

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB46BDL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-17DA64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/23/02

Injection Volume: 1.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	10.91	5900	NJD
2.		~~UNKNOWN~~	12.71	1700	JD
3.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.06	8000	NJD
4.		~~UNKNOWN~~	13.31	1800	JD
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-18B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	770	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	770	U
83-32-9	Acenaphthene	380	U

RLS

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-18B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted: 12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U R,S
100-02-7	4-Nitrophenol	770	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	770	U
534-52-1	4,6-Dinitro-2-methylphenol	770	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U R,Y
87-86-5	Pentachlorophenol	380	U R,S
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	120	J L,S
56-55-3	Benzo(a)anthracene	380	U R,S
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	640	L,S
205-99-2	Benzo(b)fluoranthene	380	U R,S
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB46C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-18B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.32	300	JB
2.		UNKNOWN (BC)	5.61	660	JB
3.		UNKNOWN CARBOXYLIC ACID	16.92	440	J
4.		UNKNOWN	17.22	440	J
5.		UNKNOWN PHTHALATE	18.80	360	J
6.		UNKNOWN PHTHALATE	18.92	560	J
7.		UNKNOWN PHTHALATE	18.95	390	J
8.		UNKNOWN PHTHALATE	19.21	460	J
9.	28553-12-0	1,2-BENZENEDICARBOXYLIC ACID	19.25	720	NJ NJ, C
10.		UNKNOWN PHTHALATE	19.40	1600	J
11.		UNKNOWN PHTHALATE	19.49	400	J
12.		UNKNOWN PHTHALATE	19.58	890	J
13.		UNKNOWN PHTHALATE	19.63	1800	J
14.		UNKNOWN PHTHALATE	19.68	820	J
15.		UNKNOWN PHTHALATE	19.71	1100	J
16.		UNKNOWN PHTHALATE	19.76	1300	J
17.		UNKNOWN PHTHALATE	19.85	760	J
18.		UNKNOWN PHTHALATE	19.91	790	J
19.		UNKNOWN PHTHALATE	19.99	470	J
20.		UNKNOWN CARBOXYLIC ACID	23.36	400	J
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22.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46CRE

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-18RB64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted: 01/02/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/02/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U R/N
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	770	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	770	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB46CRE

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-18RB64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:01/02/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/02/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U R,h
100-02-7	4-Nitrophenol	770	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	770	U
534-52-1	4,6-Dinitro-2-methylphenol	770	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB46CRE

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-18RB64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:01/02/03

Concentrated Extract Volume: 1000(uL) Date Analyzed: 01/02/03

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.32	220	JB
2.		UNKNOWN (BC)	5.63	2000	JB
3.		UNKNOWN (BC)	6.80	180	JB
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB49A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-19B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 21 decanted: (Y/N) Y Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U UJ,M
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	310	J
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U UJ,M
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB49A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-19B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 21 decanted: (Y/N) Y Date Extracted: 12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	840	U
121-14-2	2,4-Dinitrotoluene	510	J,r
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	1900	
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	840	U UJ,M
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	110	J J,r
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	U R,r
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	420	U
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	150	J
206-44-0	Fluoranthene	420	U
129-00-0	Pyrene	420	U
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U UJ,M
117-81-7	bis(2-ethylhexyl)Phthalate	480	
56-55-3	Benzo(a)anthracene	420	U
218-01-9	Chrysene	420	U
117-84-0	Di-n-octylphthalate	420	U
205-99-2	Benzo(b)fluoranthene	420	U
207-08-9	Benzo(k)fluoranthene	420	U
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	420	U
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	420	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB49A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-19B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 21 decanted: (Y/N) Y Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~ (BC)	5.32	~~390~~	JB
2.		UNKNOWN (BC)	5.61	830	JB
3.		~~UNKNOWN~~	10.85	~~780~~	J
4.	118-96-7	BENZENE, 2-METHYL-1,3,5-TRIN	10.94	18000	NJ NJ, t
5.		~~UNKNOWN~~	~~12.26~~	~~290~~	J
6.		~~UNKNOWN~~	12.69	~~200~~	J
7.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.05	560	NJ NJ, t
8.		~~UNKNOWN~~	~~13.29~~	~~330~~	J
9.		UNKNOWN	21.30	320	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB49B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-20B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	760	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	760	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB49B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-20B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 13 decanted: (Y/N) N Date Extracted: 12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	760	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	760	U
534-52-1	4,6-Dinitro-2-methylphenol	760	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U R,r
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB49B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-20B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~ (BC)	~~5.33~~	~~270~~	~~JB~~
2.		~~UNKNOWN~~ (BC)	~~5.61~~	~~610~~	~~JB~~
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-11

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-15B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	29	J
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-11

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-15B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	430	J,V
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	87	J J,V
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R,V
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	1100	
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-11

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: T2810-15B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/11/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.32~~	~~230~~	~~JB~~
2.		UNKNOWN (BC)	5.61	530	JB
3.					
4.					
5.					
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FORM I SV-TIC

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
309-00-2	Aldrin	1.0	U	
319-84-6	alpha-BHC	1.0	U	
319-85-7	beta-BHC	2.0	U	
319-86-8	delta-BHC	1.0	U	
58-89-9	gamma-BHC (Lindane)	1.0	U	
72-54-8	4,4'-DDD	4.0	U	
~~72-55-9~~	~~4,4'-DDE~~	20	E	see dilution
50-29-3	4,4'-DDT	6.0	U	
60-57-1	Dieldrin	11		
959-98-8	Endosulfan I	2.0	U	
33213-65-9	Endosulfan II	4.0	U	
1031-07-8	Endosulfan sulfate	4.0	U	
72-20-8	Endrin	4.0	U	
7421-93-4	Endrin Aldehyde	4.0	U	
76-44-8	Heptachlor	1.3		
~~1024-57-3~~	~~Heptachlor Epoxide~~	47	E	see dilution
72-43-5	Methoxychlor	10	U	
8001-35-2	Toxaphene	100	U	
~~12674-11-2~~	~~Aroclor-1016~~	~~78~~	U	Do not use this extract was florisil cleaned.
~~11104-28-2~~	~~Aroclor-1221~~	~~100~~	U	
~~11141-16-5~~	~~Aroclor-1232~~	~~78~~	U	
~~53469-21-9~~	~~Aroclor-1242~~	~~54~~	U	
~~12672-29-6~~	~~Aroclor-1248~~	~~54~~	U	
~~11097-69-1~~	~~Aroclor-1254~~	~~660~~	E	
~~11096-82-5~~	~~Aroclor-1260~~	~~160~~		
53494-70-5	Endrin Ketone	10	U	
~~5103-74-2~~	~~gamma-Chlordane~~	~~68~~	EP	see dilution
~~5103-71-9~~	~~alpha-Chlordane~~	~~60~~	E	see dilution

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46ADL

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/27/02

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
309-00-2	Aldrin	10	U	
319-84-6	alpha-BHC	10	U	
319-85-7	beta-BHC	20	U	
319-86-8	delta-BHC	10	U	
58-89-9	gamma-BHC (Lindane)	10	U	
72-54-8	4,4'-DDD	40	U	
72-55-9	4,4'-DDE	60	DP	J,g
50-29-3	4,4'-DDT	60	U	
60-57-1	Dieldrin	20	U	
959-98-8	Endosulfan I	20	U	
33213-65-9	Endosulfan II	40	U	
1031-07-8	Endosulfan sulfate	25	DJP	J,c
72-20-8	Endrin	40	U	
7421-93-4	Endrin Aldehyde	40	U	
76-44-8	Heptachlor	5.9	DJ	
1024-57-3	Heptachlor Epoxide	21	DP	J,g
72-43-5	Methoxychlor	100	U	
8001-35-2	Toxaphene	1000	U	
12674-11-2	Aroclor-1016	~~780~~	U	do not use
11104-28-2	Aroclor-1221	1000	U	
11141-16-5	Aroclor-1232	780	U	
53469-21-9	Aroclor-1242	540	U	
12672-29-6	Aroclor-1248	540	U	
11097-69-1	Aroclor-1254	900	D	
11096-82-5	Aroclor-1260	270	DJ	
53494-70-5	Endrin Ketone	100	U	
5103-74-2	gamma-Chlordane	55	D	
5103-71-9	alpha-Chlordane	62	D	

For use Only: DDE
Heptachlor Epoxide
gamma Chlordane
alpha Chlordane

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46ARE

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/27/02

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	2.0	U UJ,S
319-84-6	alpha-BHC	2.0	U
319-85-7	beta-BHC	4.1	U
319-86-8	delta-BHC	2.0	U
58-89-9	gamma-BHC (Lindane)	2.0	U
72-54-8	4,4'-DDD	8.0	U J
72-55-9	4,4'-DDE	15	P J,S
50-29-3	4,4'-DDT	12	U UJ,S
60-57-1	Dieldrin	4.1	U
959-98-8	Endosulfan I	4.1	U
33213-65-9	Endosulfan II	8.0	U
1031-07-8	Endosulfan sulfate	8.0	U
72-20-8	Endrin	8.0	U
7421-93-4	Endrin Aldehyde	8.0	U
76-44-8	Heptachlor	1.7	JP J,S
1024-57-3	Heptachlor Epoxide	7.0	P
72-43-5	Methoxychlor	20	U UJ,S
8001-35-2	Toxaphene	200	U
12674-11-2	Aroclor-1016	160	U UJ,S
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	160	U
53469-21-9	Aroclor-1242	110	U
12672-29-6	Aroclor-1248	110	U
11097-69-1	Aroclor-1254	690	J,S
11096-82-5	Aroclor-1260	260	J,S
53494-70-5	Endrin Ketone	20	U UJ,S
5103-74-2	gamma-Chlordane	46	E J,S
5103-71-9	alpha-Chlordane	59	E

PCB use only

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
309-00-2	Aldrin	4.4	P	J,C
319-84-6	alpha-BHC	1.0	U	
319-85-7	beta-BHC	2.0	U	
319-86-8	delta-BHC	1.0	U	
58-89-9	gamma-BHC (Lindane)	1.0	U	
72-54-8	4,4'-DDD	4.0	U	
72-55-9	4,4'-DDE	25	EP	J,S
50-29-3	4,4'-DDT	6.0	U	
60-57-1	Dieldrin	2.0	U	
959-98-8	Endosulfan I	2.0	U	
33213-65-9	Endosulfan II	4.0	U	
1031-07-8	Endosulfan sulfate	4.0	U	
72-20-8	Endrin	4.0	U	
7421-93-4	Endrin Aldehyde	4.0	U	
76-44-8	Heptachlor	2.8	P	J,S
1024-57-3	Heptachlor Epoxide	540	E	J,S see dilution
72-43-5	Methoxychlor	10	U	
8001-35-2	Toxaphene	100	U	
12674-11-2	Aroclor-1016	78	U	
11104-28-2	Aroclor-1221	100	U	
11141-16-5	Aroclor-1232	78	U	
53469-21-9	Aroclor-1242	54	U	
12672-29-6	Aroclor-1248	54	U	
11097-69-1	Aroclor-1254	840	E	J,S
11096-82-5	Aroclor-1260	170		J,S
53494-70-5	Endrin Ketone	10	U	
5103-74-2	gamma-Chlordane	63	EP	J,S
5103-71-9	alpha-Chlordane	650	EP	J,S see dilution

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46BDL

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/24/02

Injection Volume: 2.0(uL) Dilution Factor: 100.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	100	U
319-84-6	alpha-BHC	100	U
319-85-7	beta-BHC	200	U
319-86-8	delta-BHC	100	U
58-89-9	gamma-BHC (Lindane)	100	U
72-54-8	4,4'-DDD	400	U
72-55-9	4,4'-DDE	200	U
50-29-3	4,4'-DDT	600	U
60-57-1	Dieldrin	200	U
959-98-8	Endosulfan I	200	U
33213-65-9	Endosulfan II	400	U
1031-07-8	Endosulfan sulfate	400	U
72-20-8	Endrin	400	U
7421-93-4	Endrin Aldehyde	400	U
76-44-8	Heptachlor	100	U
1024-57-3	Heptachlor Epoxide	530	D
72-43-5	Methoxychlor	1000	U
8001-35-2	Toxaphene	10000	U
12674-11-2	Aroclor-1016	7800	U
11104-28-2	Aroclor-1221	10000	U
11141-16-5	Aroclor-1232	7800	U
53469-21-9	Aroclor-1242	5400	U
12672-29-6	Aroclor-1248	5400	U
11097-69-1	Aroclor-1254	5400	U
11096-82-5	Aroclor-1260	7800	U
53494-70-5	Endrin Ketone	1000	U
5103-74-2	gamma-Chlordane	100	U
5103-71-9	alpha-Chlordane	490	DP J,g

For heptachlor exopide and alpha chlordane results ONLY, this extract was fluorocil cleaned.

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46BRE

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/27/02

Injection Volume: 2.0(uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
~~309-00-2~~	~~Aldrin~~	~~2.0~~	~~U~~
319-84-6	alpha-BHC	2.0	U
319-85-7	beta-BHC	4.1	U
319-86-8	delta-BHC	2.0	U
58-89-9	gamma-BHC (Lindane)	2.0	U
72-54-8	4,4'-DDD	8.0	U
72-55-9	4,4'-DDE	11	P J,g
50-29-3	4,4'-DDT	12	U
60-57-1	Dieldrin	4.1	U
959-98-8	Endosulfan I	4.1	U
33213-65-9	Endosulfan II	8.0	U
1031-07-8	Endosulfan sulfate	8.0	U
72-20-8	Endrin	8.0	U
7421-93-4	Endrin Aldehyde	8.0	U
76-44-8	Heptachlor	4.0	
1024-57-3	Heptachlor Epoxide	5.0	P J,g
72-43-5	Methoxychlor	20	U
~~8001-35-2~~	~~Toxaphene~~	~~200~~	~~U~~
12674-11-2	Aroclor-1016	160	U
11104-28-2	Aroclor-1221	200	U
11141-16-5	Aroclor-1232	160	U
53469-21-9	Aroclor-1242	110	U
12672-29-6	Aroclor-1248	110	U
11097-69-1	Aroclor-1254	760	
11096-82-5	Aroclor-1260	260	
~~53494-70-5~~	~~Endrin Ketone~~	~~20~~	~~U~~
~~5103-74-2~~	~~gamma-Chlordane~~	~~36~~	~~E J,g~~
~~5103-71-9~~	~~alpha-Chlordane~~	~~39~~	~~E J,g~~

PCB results ONLY

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) Y Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
309-00-2	Aldrin	1.1	U	
319-84-6	alpha-BHC	1.1	U	
319-85-7	beta-BHC	2.2	U	UJ, m
319-86-8	delta-BHC	6.0	P	J, C
58-89-9	gamma-BHC (Lindane)	1.1	U	
72-54-8	4,4'-DDD	4.2	U	
72-55-9	4,4'-DDE	7.6	P	J, m
50-29-3	4,4'-DDT	6.3	U	
60-57-1	Dieldrin	2.2	U	
959-98-8	Endosulfan I	2.2	U	
33213-65-9	Endosulfan II	4.2	U	
1031-07-8	Endosulfan sulfate	4.2	U	
72-20-8	Endrin	4.2	U	
7421-93-4	Endrin Aldehyde	4.2	U	
76-44-8	Heptachlor	1.1	U	
~~1024-57-3~~	~~Heptachlor Epoxide~~	~~64~~	~~E~~	~~J, m~~ see dilution
72-43-5	Methoxychlor	3.0	J	J, m
8001-35-2	Toxaphene	110	U	
12674-11-2	Aroclor-1016	~~82~~	~~U~~	
11104-28-2	Aroclor-1221	110	U	
11141-16-5	Aroclor-1232	82	U	
53469-21-9	Aroclor-1242	57	U	
12672-29-6	Aroclor-1248	57	U	
11097-69-1	Aroclor-1254	240		
11096-82-5	Aroclor-1260	82	U	
53494-70-5	Endrin Ketone	7.5	J	
5103-74-2	gamma-Chlordane	1.1	U	
5103-71-9	alpha-Chlordane	2.2	U	

Do not use RA 3/24/03

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49ADL

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) Y Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/27/02

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	11	U
319-84-6	alpha-BHC	11	U
319-85-7	beta-BHC	22	U UJ,m
319-86-8	delta-BHC	11	U
58-89-9	gamma-BHC (Lindane)	11	U
72-54-8	4,4'-DDD	42	U
72-55-9	4,4'-DDE	280 ~~22~~	~~U~~ JJ
50-29-3	4,4'-DDT	63	U
60-57-1	Dieldrin	22	U
959-98-8	Endosulfan I	22	U
33213-65-9	Endosulfan II	42	U
1031-07-8	Endosulfan sulfate	42	U
72-20-8	Endrin	42	U
7421-93-4	Endrin Aldehyde	42	U
76-44-8	Heptachlor	11	U
1024-57-3	Heptachlor Epoxide	11	U
72-43-5	Methoxychlor	110	U
8001-35-2	Toxaphene	1100	U
12674-11-2	Aroclor-1016	~~820~~	~~U~~
11104-28-2	Aroclor-1221	1100	U
11141-16-5	Aroclor-1232	820	U
53469-21-9	Aroclor-1242	570	U
12672-29-6	Aroclor-1248	570	U
11097-69-1	Aroclor-1254	300	DJ
11096-82-5	Aroclor-1260	~~820~~	~~U~~
53494-70-5	Endrin Ketone	110	U
5103-74-2	gamma-Chlordane	11	U
5103-71-9	alpha-Chlordane	22	U

RA 5/21/03

DO NOT USE RA

Use only heptachlor epoxide.

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49ARE

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) Y Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/27/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.1	U
319-84-6	alpha-BHC	1.1	U
319-85-7	beta-BHC	2.2	U
319-86-8	delta-BHC	1.1	U
58-89-9	gamma-BHC (Lindane)	1.1	U
72-54-8	4,4'-DDD	4.2	U
72-55-9	4,4'-DDE	2.2	U
50-29-3	4,4'-DDT	6.3	U
60-57-1	Dieldrin	2.2	U
959-98-8	Endosulfan I	2.2	U
33213-65-9	Endosulfan II	4.2	U
1031-07-8	Endosulfan sulfate	4.2	U
72-20-8	Endrin	4.2	U
7421-93-4	Endrin Aldehyde	4.2	U
76-44-8	Heptachlor	1.1	U
1024-57-3	Heptachlor Epoxide	1.7	P
72-43-5	Methoxychlor	11	U
8001-35-2	Toxaphene	110	U
12674-11-2	Aroclor-1016	82	U
11104-28-2	Aroclor-1221	110	U
11141-16-5	Aroclor-1232	82	U
53469-21-9	Aroclor-1242	57	U
12672-29-6	Aroclor-1248	57	U
11097-69-1	Aroclor-1254	230	
11096-82-5	Aroclor-1260	82	U
53494-70-5	Endrin Ketone	11	U
5103-74-2	gamma-Chlordane	1.9	
5103-71-9	alpha-Chlordane	2.2	U

FOR PCB results ONLY

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 13 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/24/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.95	U
319-84-6	alpha-BHC	0.95	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	0.95	U
58-89-9	gamma-BHC (Lindane)	0.95	U
72-54-8	4,4'-DDD	3.8	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	5.7	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.8	U
1031-07-8	Endosulfan sulfate	3.8	U
72-20-8	Endrin	3.8	U
7421-93-4	Endrin Aldehyde	3.8	U
76-44-8	Heptachlor	0.95	U
1024-57-3	Heptachlor Epoxide	2.6	
72-43-5	Methoxychlor	9.5	U
8001-35-2	Toxaphene	95	U
12674-11-2	Aroclor-1016	75	U
11104-28-2	Aroclor-1221	98	U
11141-16-5	Aroclor-1232	75	U
53469-21-9	Aroclor-1242	52	U
12672-29-6	Aroclor-1248	52	U
11097-69-1	Aroclor-1254	52	U
11096-82-5	Aroclor-1260	75	U
53494-70-5	Endrin Ketone	9.5	U
5103-74-2	gamma-Chlordane	0.95	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB43A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
91-20-3	Naphthalene	450		
83-32-9	Acenaphthene	3500	EP	J, g
86-73-7	Fluorene	50	U	
129-00-0	Pyrene	17	J	
85-01-8	Phenanthrene	50	U	
120-12-7	Anthracene	50	U	
206-44-0	Fluoranthene	29	P	J, g
218-01-9	Chrysene	18	P	↓
205-99-2	Benzo(b)fluoranthene	50	P	
207-08-9	Benzo(k)fluoranthene	7.9	JP	↓
53-70-3	Dibenzo(a,h)anthracene	8.9	J	
191-24-2	Benzo(g,h,i)perylene	6.5	J	
56-55-3	Benzo(a)anthracene	5.6	J	
50-32-8	Benzo(a)pyrene	26	P	J/g
193-39-5	Indeno(1,2,3-cd)pyrene	35	P	J/g
208-96-8	Acenaphthylene	50	U	J/g

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB43B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 11 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	47	U
83-32-9	Acenaphthene	47	U
86-73-7	Fluorene	47	U
129-00-0	Pyrene	19	U
85-01-8	Phenanthrene	47	U
120-12-7	Anthracene	47	U
206-44-0	Fluoranthene	19	U
218-01-9	Chrysene	9.3	U
205-99-2	Benzo(b)fluoranthene	9.3	U
207-08-9	Benzo(k)fluoranthene	9.3	U
53-70-3	Dibenzo(a,h)anthracene	9.3	U
191-24-2	Benzo(g,h,i)perylene	9.3	U
56-55-3	Benzo(a)anthracene	9.3	U
50-32-8	Benzo(a)pyrene	9.3	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.3	U
208-96-8	Acenaphthylene	47	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB43C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	6.7	J
207-08-9	Benzo(k)fluoranthene	9.0	JP J/g
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	5.8	J
193-39-5	Indeno(1,2,3-cd)pyrene	5.1	J
208-96-8	Acenaphthylene	51	U

FORM I PEST

AMENDED DATA

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1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB44A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	11	JP J,8
218-01-9	Chrysene	9.6	U
205-99-2	Benzo(b)fluoranthene	9.6	U
207-08-9	Benzo(k)fluoranthene	9.6	U
53-70-3	Dibenzo(a,h)anthracene	9.6	U
191-24-2	Benzo(g,h,i)perylene	9.6	U
56-55-3	Benzo(a)anthracene	9.6	U
50-32-8	Benzo(a)pyrene	9.6	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.6	U
208-96-8	Acenaphthylene	49	U

FORM I PEST

DATA

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1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB44B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
91-20-3	Naphthalene	830		L,S
83-32-9	Acenaphthene	20000	EP	
86-73-7	Fluorene	37	JP	
129-00-0	Pyrene	57		
85-01-8	Phenanthrene	48	J	
120-12-7	Anthracene	7.2	J	
206-44-0	Fluoranthene	64	P	
218-01-9	Chrysene	49	P	
205-99-2	Benzo(b)fluoranthene	87	P	
207-08-9	Benzo(k)fluoranthene	44	PJ,C	
53-70-3	Dibenzo(a,h)anthracene	9.8	U	UL,S
191-24-2	Benzo(g,h,i)perylene	14	P	L,S
56-55-3	Benzo(a)anthracene	25	P	
50-32-8	Benzo(a)pyrene	34	P	
193-39-5	Indeno(1,2,3-cd)pyrene	35	P	
208-96-8	Acenaphthylene	340	P	

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB44C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	50	U
83-32-9	Acenaphthene	50	U
86-73-7	Fluorene	50	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	50	U
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	9.9	U
207-08-9	Benzo(k)fluoranthene	9.9	U
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	9.9	U
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	50	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	650	P J,g
83-32-9	Acenaphthene	16000	EP
86-73-7	Fluorene	13	JP
129-00-0	Pyrene	160	
85-01-8	Phenanthrene	94	
120-12-7	Anthracene	26	J
206-44-0	Fluoranthene	160	P J,g
218-01-9	Chrysene	61	
205-99-2	Benzo(b)fluoranthene	51	P J,g
207-08-9	Benzo(k)fluoranthene	140	P J,c
53-70-3	Dibenzo(a,h)anthracene	18	P J,g
191-24-2	Benzo(g,h,i)perylene	51	P J,g
56-55-3	Benzo(a)anthracene	55	
50-32-8	Benzo(a)pyrene	68	
193-39-5	Indeno(1,2,3-cd)pyrene	100	P J,g
208-96-8	Acenaphthylene	16	JP J,g

FORM I PEST

AMENDED DATA

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.6	U
205-99-2	Benzo(b)fluoranthene	9.6	U
207-08-9	Benzo(k)fluoranthene	9.6	U
53-70-3	Dibenzo(a,h)anthracene	9.6	U
191-24-2	Benzo(g,h,i)perylene	9.6	U
56-55-3	Benzo(a)anthracene	9.6	U
50-32-8	Benzo(a)pyrene	9.6	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.6	U
208-96-8	Acenaphthylene	49	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
91-20-3	Naphthalene	8600	EP	J,d
83-32-9	Acenaphthene	2400	EP	J,m
86-73-7	Fluorene	53	U	
129-00-0	Pyrene	35		
85-01-8	Phenanthrene	25	J	J,d
120-12-7	Anthracene	53	U	
206-44-0	Fluoranthene	72		J,d
218-01-9	Chrysene	42	P	J,m
205-99-2	Benzo(b)fluoranthene	100		J,m
207-08-9	Benzo(k)fluoranthene	32	P	J,d
53-70-3	Dibenzo(a,h)anthracene	10	U	
191-24-2	Benzo(g,h,i)perylene	10	U	
56-55-3	Benzo(a)anthracene	15		J,m
50-32-8	Benzo(a)pyrene	57	P	J,m
193-39-5	Indeno(1,2,3-cd)pyrene	10	U	
208-96-8	Acenaphthylene	240	P	J,m

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 13 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	48	U
83-32-9	Acenaphthene	48	U
86-73-7	Fluorene	48	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	48	U
120-12-7	Anthracene	48	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.5	U
205-99-2	Benzo(b)fluoranthene	9.5	U
207-08-9	Benzo(k)fluoranthene	9.5	U
53-70-3	Dibenzo(a,h)anthracene	9.5	U
191-24-2	Benzo(g,h,i)perylene	9.5	U
56-55-3	Benzo(a)anthracene	9.5	U
50-32-8	Benzo(a)pyrene	9.5	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.5	U
208-96-8	Acenaphthylene	48	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-11

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/11/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	21	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	21	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB35B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB36A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,2
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB36B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR,9
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB37A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB37B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	UUJ,C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB38A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB38B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB43A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,X
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U VJ,C

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB43B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,X
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB43C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB44A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB44B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB44C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/09/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, JC
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	59	Z JC
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	11	
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	9.6	Z
1946-51-0	4-Amino-2,6-dinitrotoluene	14	Z
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U UJC

Z (Results reported with a ten fold dilution)

AMENDED DATA

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/09/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	110	E J,C
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,X
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	68	Z J,C
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	160	Z
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	35	Z
1946-51-0	4-Amino-2,6-dinitrotoluene	31	Z
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U UJ,C

Z (Results reported with a ten fold dilution)

AMENDED DATA

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR, J
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	UJ, C
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/09/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U UJ,m
99-35-4	1,3,5-Trinitrobenzene	1.9	JPZ J, l
121-82-4	RDX	8.2	JZ
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	80	E J,c
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U UJ,m
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U UJ,c

Z (Results reported with a ten fold dilution)

AMENDED DATA

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,X
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U VJ,C
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-11

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR, J
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-9

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/28/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB35B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/03/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0---------	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB36A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/03/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB36B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/03/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0---------	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB37A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB37B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0---------	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB38A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB38B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB43A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0---------	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB43B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB43C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB44A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB44B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB44C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0---------	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/11/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q	
55-63-0	Nitroglycerin	400	P	J,S

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB46C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-11

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-9

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix: (soil/water) SOIL Lab Sample ID: T2810-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/04/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/12/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

SW-846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB35B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-1

Level (low/med): LOW Date Received: 12/04/02

% Solids: 91.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5550			P	
7440-36-0	Antimony	0.39	U	N*	P	R,M
7440-38-2	Arsenic	0.26	U	N	P	UL,W
7440-39-3	Barium	57.5		E	P	J,S
7440-41-7	Beryllium	0.37	B		P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	666		E	P	J,S
7440-47-3	Chromium	9.7		N	P	L,M
7440-48-4	Cobalt	4.7		E	P	J,S
7440-50-8	Copper	2.0		N*E	P	J,K
7439-89-6	Iron	10100		E	P	J,S
7439-92-1	Lead	4.4		*E	P	J,K
7439-95-4	Magnesium	1760		E	P	J,S
7439-96-5	Manganese	220		E	P	J,S
7439-97-6	Mercury	0.018	B	N*	CV	J,K
7440-02-0	Nickel	6.2		E	P	J,S
7440-09-7	Potassium	943		E	P	J,S
7782-49-2	Selenium	0.86		N	P	G,X
7440-22-4	Silver	0.070	U		P	
7440-23-5	Sodium	129	B		P	L,W
7440-28-0	Thallium	0.53	U	N	P	UL,M
7440-62-2	Vanadium	14.6		E	P	J,S
7440-66-6	Zinc	30.1		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: FINE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB36A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-2

Level (low/med): LOW Date Received: 12/04/02

% Solids: 86.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10600			P	
7440-36-0	Antimony	0.41	U	N*	P	R,m
7440-38-2	Arsenic	0.73	B	N	P	K,W
7440-39-3	Barium	105		E	P	J,S
7440-41-7	Beryllium	0.67			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	1210		E	P	J,S
7440-47-3	Chromium	16.8		N	P	L,m
7440-48-4	Cobalt	8.2		E	P	J,S
7440-50-8	Copper	7.0		N*E	P	J,K
7439-89-6	Iron	16300		E	P	J,S
7439-92-1	Lead	7.9		*E	P	J,K
7439-95-4	Magnesium	2540		E	P	J,S
7439-96-5	Manganese	385		E	P	J,S
7439-97-6	Mercury	0.030	B	N*	CV	J,K
7440-02-0	Nickel	9.8		E	P	J,S
7440-09-7	Potassium	1120		E	P	↓
7782-49-2	Selenium	1.3		N	P	B,K
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	155	B		P	L,W
7440-28-0	Thallium	0.57	U	N	P	UL,m
7440-62-2	Vanadium	24.9		E	P	J,S
7440-66-6	Zinc	47.9		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB36B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-3

Level (low/med): LOW Date Received: 12/04/02

% Solids: 87.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10100			P	
7440-36-0	Antimony	0.42	U	N*	P	R,M
7440-38-2	Arsenic	0.44	B	N	P	K,W
7440-39-3	Barium	103		E	P	J,S
7440-41-7	Beryllium	0.61			P	
7440-43-9	Cadmium	0.050	U		P	
7440-70-2	Calcium	1220		E	P	J,S
7440-47-3	Chromium	14.6		N	P	-,M
7440-48-4	Cobalt	7.6		E	P	
7440-50-8	Copper	7.0		N*E	P	J,K
7439-89-6	Iron	15100		E	P	J,S
7439-92-1	Lead	6.1		*E	P	J,K
7439-95-4	Magnesium	2560		E	P	J,S
7439-96-5	Manganese	341		E	P	↓
7439-97-6	Mercury	0.018	U	N*	CV	U,J,K
7440-02-0	Nickel	9.4		E	P	J,S
7440-09-7	Potassium	1030		E	P	↓
7782-49-2	Selenium	1.1		N	P	B,X
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	158	B		P	L,W
7440-28-0	Thallium	0.58	U	N	P	U,L,M
7440-62-2	Vanadium	23.2		E	P	J,S
7440-66-6	Zinc	45.1		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB37A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-5

Level (low/med): LOW Date Received: 12/04/02

% Solids: 82.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15000			P	
7440-36-0	Antimony	0.43	U	N*	P	R,m
7440-38-2	Arsenic	1.3		N	P	K,w
7440-39-3	Barium	193		E	P	J,S
7440-41-7	Beryllium	0.96			P	
7440-43-9	Cadmium	0.050	U		P	
7440-70-2	Calcium	1920		E	P	J,S
7440-47-3	Chromium	22.0		N	P	L,m
7440-48-4	Cobalt	10.2		E	P	J,S
7440-50-8	Copper	22.8		N*E	P	J,K
7439-89-6	Iron	21500		E	P	J,S
7439-92-1	Lead	18.4		*E	P	J,K
7439-95-4	Magnesium	3260		E	P	J,S
7439-96-5	Manganese	826		E	P	↓
7439-97-6	Mercury	0.044		N*	CV	J,K
7440-02-0	Nickel	13.4		E	P	J,S
7440-09-7	Potassium	1360		E	P	↓
7782-49-2	Selenium	1.8		N	P	R,z
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	212	B		P	L,w
7440-28-0	Thallium	0.59	U	N	P	UL,m
7440-62-2	Vanadium	31.6		E	P	J,S
7440-66-6	Zinc	87.3		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB37B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-6

Level (low/med): LOW Date Received: 12/04/02

% Solids: 84.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9570			P	
7440-36-0	Antimony	0.42	U	N*	P	R,M
7440-38-2	Arsenic	0.60	B	N	P	K,W
7440-39-3	Barium	95.5		E	P	J,S
7440-41-7	Beryllium	0.59			P	
7440-43-9	Cadmium	0.050	U		P	
7440-70-2	Calcium	1210		E	P	J,S
7440-47-3	Chromium	15.5		N	P	L,M
7440-48-4	Cobalt	7.1		E	P	J,S
7440-50-8	Copper	5.3		N*E	P	J,K
7439-89-6	Iron	15800		E	P	J,S
7439-92-1	Lead	5.7		*E	P	J,K
7439-95-4	Magnesium	2720		E	P	J,S
7439-96-5	Manganese	331		E	P	↓
7439-97-6	Mercury	0.019	U	N*	CV	UJ,K
7440-02-0	Nickel	9.8		E	P	J,S
7440-09-7	Potassium	1330		E	P	↓
7782-49-2	Selenium	1.1		N	P	G,L
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	165	B		P	L,W
7440-28-0	Thallium	0.58	U	N	P	UL,M
7440-62-2	Vanadium	24.1		E	P	J,S
7440-66-6	Zinc	45.2		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB38A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-7

Level (low/med): LOW Date Received: 12/06/02

% Solids: 78.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13800			P	
7440-36-0	Antimony	0.46	U	N*	P	R,M
7440-38-2	Arsenic	1.6		N	P	K,W
7440-39-3	Barium	206		E	P	J,S
7440-41-7	Beryllium	1.0			P	
7440-43-9	Cadmium	0.10	B		P	
7440-70-2	Calcium	1770		E	P	J,S
7440-47-3	Chromium	21.4		N	P	L,M
7440-48-4	Cobalt	8.9		E	P	J,S
7440-50-8	Copper	21.7		N*E	P	J,K
7439-89-6	Iron	24500		E	P	J,S
7439-92-1	Lead	85.3		*E	P	J,K
7439-95-4	Magnesium	2750		E	P	J,S
7439-96-5	Manganese	909		E	P	↓
7439-97-6	Mercury	0.036	B	N*	CV	J,K
7440-02-0	Nickel	12.7		E	P	J,S
7440-09-7	Potassium	1510		E	P	↓
7782-49-2	Selenium	2.0		N	P	L,M
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	469			P	L,W
7440-28-0	Thallium	0.64	U	N	P	UL,M
7440-62-2	Vanadium	29.2		E	P	J,S
7440-66-6	Zinc	317		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB38B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-8

Level (low/med): LOW Date Received: 12/06/02

% Solids: 82.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11000			P	
7440-36-0	Antimony	0.45	U	N*	P	R,M
7440-38-2	Arsenic	0.78	B	N	P	K,W
7440-39-3	Barium	110		E	P	J,S
7440-41-7	Beryllium	0.72			P	
7440-43-9	Cadmium	0.050	U		P	
7440-70-2	Calcium	1450		E	P	J,S
7440-47-3	Chromium	17.2		N	P	L,M
7440-48-4	Cobalt	8.8		E	P	
7440-50-8	Copper	13.3		N*E	P	J,K
7439-89-6	Iron	17000		E	P	J,S
7439-92-1	Lead	7.0		*E	P	J,K
7439-95-4	Magnesium	2990		E	P	J,S
7439-96-5	Manganese	465		E	P	↓
7439-97-6	Mercury	0.026	B	N*	CV	J,K
7440-02-0	Nickel	10.4		E	P	J,S
7440-09-7	Potassium	1190		E	P	↓
7782-49-2	Selenium	1.3		N	P	L,M
7440-22-4	Silver	0.090	U		P	
7440-23-5	Sodium	178	B		P	L,W
7440-28-0	Thallium	0.62	U	N	P	UL,M
7440-62-2	Vanadium	25.4		E	P	J,S
7440-66-6	Zinc	51.2		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB43A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-9

Level (low/med): LOW Date Received: 12/06/02

% Solids: 83.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13800			P	
7440-36-0	Antimony	0.43	U	N*	P	R,M
7440-38-2	Arsenic	1.2		N	P	K,W
7440-39-3	Barium	118		E	P	J,S
7440-41-7	Beryllium	0.63			P	
7440-43-9	Cadmium	0.05	B		P	
7440-70-2	Calcium	1610		E	P	J,S
7440-47-3	Chromium	17.6		N	P	L,M
7440-48-4	Cobalt	6.8		E	P	J,S
7440-50-8	Copper	22.8		N*E	P	J,K
7439-89-6	Iron	17900		E	P	J,S
7439-92-1	Lead	249		*E	P	J,K
7439-95-4	Magnesium	2420		E	P	J,S
7439-96-5	Manganese	480		E	P	↓
7439-97-6	Mercury	0.15		N*	CV	J,K
7440-02-0	Nickel	9.6		E	P	J,S
7440-09-7	Potassium	1610		E	P	↓
7782-49-2	Selenium	1.3		N	P	L,M
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	286			P	L,W
7440-28-0	Thallium	0.59	U	N	P	UL,M
7440-62-2	Vanadium	28.1		E	P	J,S
7440-66-6	Zinc	147		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB43B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-10

Level (low/med): LOW Date Received: 12/06/02

% Solids: 88.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9180			P	
7440-36-0	Antimony	0.41	U	N*	P	R,M
7440-38-2	Arsenic	0.60	B	N	P	K,W
7440-39-3	Barium	89.3		E	P	J,S
7440-41-7	Beryllium	0.52	B		P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	905		E	P	J,S
7440-47-3	Chromium	15.7		N	P	L,M
7440-48-4	Cobalt	6.3		E	P	
7440-50-8	Copper	0.16	U	N*E	P	R,M
7439-89-6	Iron	15000		E	P	J,S
7439-92-1	Lead	7.2		*E	P	J,K
7439-95-4	Magnesium	2510		E	P	J,S
7439-96-5	Manganese	274		E	P	↓
7439-97-6	Mercury	0.019	U	N*	CV	UJ,K
7440-02-0	Nickel	9.1		E	P	J,S
7440-09-7	Potassium	1490		E	P	↓
7782-49-2	Selenium	0.91		N	P	L,M
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	176	B		P	L,W
7440-28-0	Thallium	0.57	U	N	P	UL,M
7440-62-2	Vanadium	25.5		E	P	J,S
7440-66-6	Zinc	40.4		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: FINE

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB43C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-11

Level (low/med): LOW Date Received: 12/06/02

% Solids: 83.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	7080			P	
7440-36-0	Antimony	0.44	U	N*	P	R,M
7440-38-2	Arsenic	0.35	B	N	P	K,W
7440-39-3	Barium	73.5		E	P	J,S
7440-41-7	Beryllium	0.43	B		P	
7440-43-9	Cadmium	0.050	U		P	
7440-70-2	Calcium	791		E	P	J,S
7440-47-3	Chromium	12.3		N	P	L,M
7440-48-4	Cobalt	4.8		E	P	
7440-50-8	Copper	0.17	U	N*E	P	R,M
7439-89-6	Iron	12300		E	P	J,S
7439-92-1	Lead	5.5		*E	P	J,K
7439-95-4	Magnesium	2300		E	P	J,S
7439-96-5	Manganese	247		E	P	↓
7439-97-6	Mercury	0.022	B	N*	CV	J,K
7440-02-0	Nickel	7.3		E	P	J,S
7440-09-7	Potassium	1370		E	P	↓
7782-49-2	Selenium	0.79		N	P	L,M
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	170	B		P	L,W
7440-28-0	Thallium	0.60	U	N	P	U,L,M
7440-62-2	Vanadium	19.5		E	P	J,S
7440-66-6	Zinc	33.3		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB44A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-12

Level (low/med): LOW Date Received: 12/06/02

% Solids: 85.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	8690			P	
7440-36-0	Antimony	0.40	U	N*	P	R,M
7440-38-2	Arsenic	1.1		N	P	K,W
7440-39-3	Barium	141		E	P	J,S
7440-41-7	Beryllium	0.69			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	636		E	P	J,S
7440-47-3	Chromium	14.8		N	P	L,M
7440-48-4	Cobalt	7.6		E	P	J,S
7440-50-8	Copper	8.3		N*E	P	J,K
7439-89-6	Iron	13200		E	P	J,S
7439-92-1	Lead	16.7		*E	P	J,K
7439-95-4	Magnesium	1120		E	P	J,S
7439-96-5	Manganese	620		E	P	↓
7439-97-6	Mercury	0.031	B	N*	CV	J,K
7440-02-0	Nickel	7.0		E	P	J,S
7440-09-7	Potassium	749		E	P	↓
7782-49-2	Selenium	1.1		N	P	L,M
7440-22-4	Silver	0.070	U		P	
7440-23-5	Sodium	150	B		P	L,W
7440-28-0	Thallium	0.55	U	N	P	UL,M
7440-62-2	Vanadium	25.0		E	P	J,S
7440-66-6	Zinc	52.6		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB44B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-13

Level (low/med): LOW Date Received: 12/06/02

% Solids: 85.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	19000			P	
7440-36-0	Antimony	0.43	U	N*	P	R,M
7440-38-2	Arsenic	2.1		N	P	K,W
7440-39-3	Barium	140		E	P	J,S
7440-41-7	Beryllium	0.89			P	
7440-43-9	Cadmium	0.050	U		P	
7440-70-2	Calcium	1320		E	P	J,S
7440-47-3	Chromium	23.5		N	P	L,M
7440-48-4	Cobalt	10.7		E	P	
7440-50-8	Copper	11.8		N*E	P	J,K
7439-89-6	Iron	28400		E	P	J,S
7439-92-1	Lead	12.1		*E	P	J,K
7439-95-4	Magnesium	4860		E	P	J,S
7439-96-5	Manganese	494		E	P	↓
7439-97-6	Mercury	0.041		N*	CV	J,K
7440-02-0	Nickel	15.6		E	P	J,S
7440-09-7	Potassium	2720		E	P	↓
7782-49-2	Selenium	1.6		N	P	L,M
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	208	B		P	L,W
7440-28-0	Thallium	0.59	U	N	P	UL,M
7440-62-2	Vanadium	46.1		E	P	J,S
7440-66-6	Zinc	63.8		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB44C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-14

Level (low/med): LOW Date Received: 12/06/02

% Solids: 83.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15500			P	
7440-36-0	Antimony	0.44	U	N*	P	R|M
7440-38-2	Arsenic	2.4		N	P	L|M
7440-39-3	Barium	137		E	P	J|S
7440-41-7	Beryllium	0.81			P	
7440-43-9	Cadmium	0.050	U		P	
7440-70-2	Calcium	1780		E	P	J|S
7440-47-3	Chromium	21.0		N	P	L|M
7440-48-4	Cobalt	8.5		E	P	
7440-50-8	Copper	12.3		N*E	P	J|K
7439-89-6	Iron	22900		E	P	
7439-92-1	Lead	8.4		*E	P	J|K
7439-95-4	Magnesium	4670		E	P	J|S
7439-96-5	Manganese	338		E	P	↓
7439-97-6	Mercury	0.018	U	N*	CV	U|K
7440-02-0	Nickel	13.1		E	P	J|S
7440-09-7	Potassium	2410		E	P	↓
7782-49-2	Selenium	0.99		N	P	L|M
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	187	B		P	L|W
7440-28-0	Thallium	0.61	U	N	P	U|L|M
7440-62-2	Vanadium	38.3		E	P	J|S
7440-66-6	Zinc	47.0		N*E	P	J|K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB46A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-16

Level (low/med): LOW Date Received: 12/06/02

% Solids: 82.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14300			P	
7440-36-0	Antimony	1.9		N*	P	K,W
7440-38-2	Arsenic	5.1		N	P	L,M
7440-39-3	Barium	228		E	P	J,S
7440-41-7	Beryllium	0.66			P	
7440-43-9	Cadmium	0.64			P	
7440-70-2	Calcium	14900		E	P	J,S
7440-47-3	Chromium	31.9		N	P	L,M
7440-48-4	Cobalt	6.5		E	P	J,S
7440-50-8	Copper	195		N*E	P	J,K
7439-89-6	Iron	23300		E	P	J,S
7439-92-1	Lead	3610		*E	P	J,K
7439-95-4	Magnesium	9040		E	P	J,S
7439-96-5	Manganese	406		E	P	↓
7439-97-6	Mercury	0.77		N*	CV	J,K
7440-02-0	Nickel	16.6		E	P	J,S
7440-09-7	Potassium	1390		E	P	↓
7782-49-2	Selenium	1.9		N	P	L,M
7440-22-4	Silver	0.11	B		P	
7440-23-5	Sodium	746			P	
7440-28-0	Thallium	0.60	U	N	P	U,L,M
7440-62-2	Vanadium	37.4		E	P	J,S
7440-66-6	Zinc	555		N*E	P	J,K

Color Before: BLACK Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB46B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-17

Level (low/med): LOW Date Received: 12/06/02

% Solids: 82.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10000			P	
7440-36-0	Antimony	20.7		N*	P	J,K
7440-38-2	Arsenic	4.2		N	P	L,M
7440-39-3	Barium	245		E	P	J,S
7440-41-7	Beryllium	0.58			P	
7440-43-9	Cadmium	0.74			P	
7440-70-2	Calcium	33900		E	P	J,S
7440-47-3	Chromium	38.5		N	P	L,M
7440-48-4	Cobalt	6.6		E	P	J,S
7440-50-8	Copper	320		N*E	P	J,K
7439-89-6	Iron	22800		E	P	J,S
7439-92-1	Lead	3070		*E	P	J,K
7439-95-4	Magnesium	18500		E	P	J,S
7439-96-5	Manganese	475		E	P	
7439-97-6	Mercury	0.80		N*	CV	J,K
7440-02-0	Nickel	21.6		E	P	J,S
7440-09-7	Potassium	1570		E	P	↓
7782-49-2	Selenium	1.5		N	P	L,M
7440-22-4	Silver	0.20	B		P	
7440-23-5	Sodium	1020			P	
7440-28-0	Thallium	0.58	U	N	P	UL,M
7440-62-2	Vanadium	25.7		E	P	J,S
7440-66-6	Zinc	762		N*E	P	J,K

Color Before: BLACK Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB46C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-18

Level (low/med): LOW Date Received: 12/06/02

% Solids: 86.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10400			P	
7440-36-0	Antimony	0.41	U	N*	P	R,M
7440-38-2	Arsenic	0.58	B	N	P	K,W
7440-39-3	Barium	103		E	P	J,S
7440-41-7	Beryllium	0.58			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	967		E	P	J,S
7440-47-3	Chromium	17.2		N	P	L,M
7440-48-4	Cobalt	7.3		E	P	J,S
7440-50-8	Copper	2.5		N*E	P	J,K
7439-89-6	Iron	17200		E	P	J,S
7439-92-1	Lead	8.4		*E	P	J,K
7439-95-4	Magnesium	3070		E	P	J,S
7439-96-5	Manganese	290		E	P	↓
7439-97-6	Mercury	0.019	B	N*	CV	J,K
7440-02-0	Nickel	9.9		E	P	J,S
7440-09-7	Potassium	2060		E	P	N
7782-49-2	Selenium	0.99		N	P	L,M
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	212	B		P	L,W
7440-28-0	Thallium	0.57	U	N	P	U,L,M
7440-62-2	Vanadium	29.3		E	P	
7440-66-6	Zinc	45.2		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: FINE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB49A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-19

Level (low/med): LOW Date Received: 12/06/02

% Solids: 54.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	22600			P	
7440-36-0	Antimony	1.9		N*	P	K,W
7440-38-2	Arsenic	2.5		N	P	K,W
7440-39-3	Barium	206		E	P	J,S
7440-41-7	Beryllium	1.1			P	
7440-43-9	Cadmium	0.070	U		P	
7440-70-2	Calcium	2510		E	P	J,S
7440-47-3	Chromium	41.6		N	P	L,M
7440-48-4	Cobalt	12.2		E	P	J,S
7440-50-8	Copper	83.1		N*E	P	J,K
7439-89-6	Iron	35100		E	P	J,S
7439-92-1	Lead	257		*E	P	J,K
7439-95-4	Magnesium	5260		E	P	J,S
7439-96-5	Manganese	536		E	P	↓
7439-97-6	Mercury	0.23		N*	CV	J,K
7440-02-0	Nickel	19.3		E	P	J,S
7440-09-7	Potassium	2880		E	P	↓
7782-49-2	Selenium	2.6		N	P	L,M
7440-22-4	Silver	0.13	U		P	
7440-23-5	Sodium	1270			P	
7440-28-0	Thallium	0.93	U	N	P	U,L,M
7440-62-2	Vanadium	58.9		E	P	J,S
7440-66-6	Zinc	180		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB49B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-20

Level (low/med): LOW Date Received: 12/06/02

% Solids: 87.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11700			P	
7440-36-0	Antimony	0.41	U	N*	P	R,M
7440-38-2	Arsenic	0.57	B	N	P	K,W
7440-39-3	Barium	103		E	P	J,S
7440-41-7	Beryllium	0.62			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	1160		E	P	J,S
7440-47-3	Chromium	18.1		N	P	L,M
7440-48-4	Cobalt	7.1		E	P	J,S
7440-50-8	Copper	4.4		N*E	P	J,C
7439-89-6	Iron	18300		E	P	J,S
7439-92-1	Lead	7.2		*E	P	J,K
7439-95-4	Magnesium	3380		E	P	J,S
7439-96-5	Manganese	297		E	P	↓
7439-97-6	Mercury	0.018	B	N*	CV	J,K
7440-02-0	Nickel	10.9		E	P	J,S
7440-09-7	Potassium	1690		E	P	↓
7782-49-2	Selenium	1.1		N	P	L,M
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	233			P	L,W
7440-28-0	Thallium	0.56	U	N	P	UL,M
7440-62-2	Vanadium	31.1		E	P	J,S
7440-66-6	Zinc	46.1		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: FINE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-11

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-15

Level (low/med): LOW Date Received: 12/06/02

% Solids: 82.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14300			P	
7440-36-0	Antimony	0.41	U	N*	P	R,M
7440-38-2	Arsenic	2.2		N	P	K,W
7440-39-3	Barium	137		E	P	J,S
7440-41-7	Beryllium	0.69			P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	1620		E	P	J,S
7440-47-3	Chromium	20.4		N	P	L,M
7440-48-4	Cobalt	8.3		E	P	J,S
7440-50-8	Copper	13.3		N*E	P	J,K
7439-89-6	Iron	21700		E	P	J,S
7439-92-1	Lead	9.0		*E	P	J,K
7439-95-4	Magnesium	4200		E	P	J,S
7439-96-5	Manganese	347		E	P	↓
7439-97-6	Mercury	0.020	U	N*	CV	UJ,K
7440-02-0	Nickel	12.3		E	P	J,S
7440-09-7	Potassium	2270		E	P	↓
7782-49-2	Selenium	1.3		N	P	L,M
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	184	B		P	L,W
7440-28-0	Thallium	0.57	U	N	P	UL,M
7440-62-2	Vanadium	36.4		E	P	J,S
7440-66-6	Zinc	46.6		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-9

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: T2810

Matrix (soil/water): SOIL Lab Sample ID: T2810-4

Level (low/med): LOW Date Received: 12/04/02

% Solids: 89.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6140			P	
7440-36-0	Antimony	0.41	U	N*	P	R,M
7440-38-2	Arsenic	0.28	U	N	P	UL,W
7440-39-3	Barium	62.2		E	P	J,S
7440-41-7	Beryllium	0.38	B		P	
7440-43-9	Cadmium	0.040	U		P	
7440-70-2	Calcium	839		E	P	J,S
7440-47-3	Chromium	10.5		N	P	L,M
7440-48-4	Cobalt	4.7		E	P	J,S
7440-50-8	Copper	0.86		N*E	P	J,K
7439-89-6	Iron	10200		E	P	J,S
7439-92-1	Lead	4.7		*E	P	J,K
7439-95-4	Magnesium	1820		E	P	J,S
7439-96-5	Manganese	200		E	P	↓
7439-97-6	Mercury	0.016	U	N*	CV	J,K
7440-02-0	Nickel	6.3		E	P	J,S
7440-09-7	Potassium	850		E	P	↓
7782-49-2	Selenium	0.79		N	P	B,K
7440-22-4	Silver	0.080	U		P	
7440-23-5	Sodium	144	B		P	L,W
7440-28-0	Thallium	0.56	U	N	P	UL,M
7440-62-2	Vanadium	15.4		E	P	J,S
7440-66-6	Zinc	30.8		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: FINE

Color After: YELLOW Clarity After: Artifacts:

Comments:

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 3/24/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: T2810
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).	✓		
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .	✓		

Notes:

collect	extract	analyzed
12/4/02	12/11/02	12/18/02 → 12/19/02
12/4/02	12/19/02	12/22/02 12/23/02

↙
545B46A L/UL/J (unless prep)
545B46B ← 545B46CRE collect 12/4/02 extract. 22 days after collect.
ext: 12/19/02 gross all ND → R/J

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes: EQB-12 in T2910 ND✓

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes: IC 12/17/02 atrazine 86.72% RSD all ND → RJ in all samples

Several Y.D. Atrazine prev. ND UJC for 2,4-DNP

8 + ~~5~~
33
30 + 45 + 3

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓	✓	
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?	✓		
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)		✓	

	1 or more <10%	2 or 3 high/low	2 or 3 all low	2 or 3 all high
Positives	L	J	L	K
Non-detects	R	UJ	UL	NONE

Note: The B qualifier remains over surrogate flagging.

Notes: 545B46C 0% for all Surr. R/L/S acceptable Sur. in 545B46CRE but this was rejected due to gross ht.
545B46A 3x Recovery for one Sur. R/S/POS. PREV. L/J
545B46A DL 5 Surr. recoveries <QC OK since DF=15 use this result
545B46B recoveries for one sur <QC. this sample Prev flagged for ht. no more action
545B46B DL " " " L/UL/S. use original result for ~~compounds~~ all except diethylphthalate unless prev.

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached
U,M in parent 545B49A

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: LCS extracted 1/2/03 benzaldehyde 7% <10-100 [redacted] all samples. no prev. R/h in
" " 12/11/02 atrazine 151% 10-150 all ND prev. filed 545B46CA

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	U		

Notes:

D-11	545B44C	D-11	545B44C
2,6, DNT 29	390 U OKV	diethylphthalate 380 U	130
2,4-DNT 430	390 U OKV	OKV	
N-nitroso 87	390 U OK		
Di-n. butyphthalte 1100	390 U OKV		

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	U		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".	U		

Notes: TIC → NJ, E

diethylphthalate "E" in some samples - prev. flagged use diluted results -

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)		✓	
12.1.1	Number of samples: 13			
12.1.2	Number of target compounds in each analysis: 65			
12.1.3	Number of results rejected and not reported: 139			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 84%			

Notes: comment

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 3/24/03
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
____ CLP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: T2810
Test Name: PEST
Method No.: 8081A

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

collect	extracted	analyzed	
12/4/02	12/11/02	12/27/02	12/24/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		

3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes: EQB-12 in SDG B2810 ND ✓

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		

Notes: See attached

pos. JC

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?			✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?			✓

	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to			
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.			
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?			
5.4	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			
5.5	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).			
5.6	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	✓		
5.7	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	✓		
5.8	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	✓		

Notes:

6.0 Surrogate Recovery		**Yes**	**No**	**NA**
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
6.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?	✓		
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)	✓		

# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
1 out	high/low	No action	No action
2 out	2 high same column	K	No action

		2 low same column	L, UL	No action
		mixed same column	J, UJ	No action
		2 high diff columns	J	Not applicable
		2 low diff columns	J, UJ	Not applicable
		mixed diff columns	Professional judgement	Not applicable
	3 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		2 high, 1 low	K (2 high)	J (1 low 2nd column)
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
		other mixed	J, UJ	Not applicable
	4 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		Mixed	J, UJ	Not applicable
	If any recovery is >0% and <10% then L(+)/R(-).			
	If any recovery is 0% then R(+/-).			

Notes: 545B46A tetrachloro-m-xylene 24 < 43-135, no action 1 failure. One or both S. out in 545B46BDL (DF=100) } no
545B46B TCX 330, 381 > 135 POS → J↓S UNLESS DIEV. √ 545B46ADLCDF=10) } action
545B49A DCB 1917 144%, no action √ 545B49ADL (DF=10) √
545B49ARE TCX, 143 & 135, no action
545B46ARE DCB 170/28, TCX 40,28 → J, UJ, S
545B46BRE DCB 32 < 43, no action √

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached
flagged in parent 545B49A

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: 4,4-DDD 230 > 150 %.
Endosulfan II 160 > 150 %. all ND, no flags

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			✓

Notes:

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		✓	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes: J,q unless prev.
Common → 4,4-DDE ND in 545B49ADL changed to 280 J,q
Signal exceeded calib "E" → J,q

11.0 Cleanup Checks		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes: Not performed.

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported:			
12.1.4	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100 %			

Notes:

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RA
Date: 3/7/03
DV Level: II (III) IV

Review Document:

_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: 72810
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes: Collected 12/4/02 Extracted 12/11/02 analyzed 12/24/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: EQB-12 in R2510 NDV ✓

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: See attached assoc. results were positive → J/c

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		✓	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: p-terphenyl 22% < 50% 5458 44B 4UL15 Lowest prev. flagged

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached
failures for MS/MSD all POS, J,M in 545B49A
POS. " RPD → J,d "

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: D-11 all ND
545B44C all ND

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

several 740 %. → J,q unless prev.

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:			
10.1.3	Number of results rejected and not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness = 100 %.			

Notes:

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 3/7/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: T2810
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 ^{0}C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

collect	extract	analyzed
12,3,02	12,12,02	12,28,02
12,4,02	〃	〃

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: EQB-11
EQB-12 in R2810 NDV

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: See attached

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached VJim for MS/MSD failures in 545B49A
all ND for RPD failures, no action.

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes: 1315 – TNB 24% < 50%, POS flagged J, L
NDs → R, L

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: D-9 and 545B36B
all ND all ND

D-11 and 545B44C
all ND all ND

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

1315 - Trinitrobenzene (112.8) >40%.
in 545849A → J1g
Several "E" → J1g unless prev. flagged

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: 20			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness = 92%.			

Notes:

DATA VALIDATION WORKSHEET

Reviewer: AJ
Date: 01/30/02
DV Level: II III IV
Review Document:
_X_ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Nitroglycerin

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: T2810
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: COC's Used: 1035, 1037, 1089

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: cooler temps 1089: 2.0°C, 1035: 2.0°C, 1037: 2.0°C
sampled: 12/03/02, 12/04/02
extracted: 12/12/02
analysis: 01/03/03, 01/04/03, 01/05/03

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			X

Notes: No field / equipment blanks in this package

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		X	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).		X	
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes: CCAL 094XNITRO4LD %D = 17.27 ~~WR @ associated samples~~ @ NO associated samples to flag since it was the final CCAL of the batch run.

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		X	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		X	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.		X	
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: ~~No action taken~~ since surrogate was diluted out.

POS → KS

RA 3/17/03

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	X		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	X		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS %R = 7200% } RPD = 85% 545B49A used for MS/MSD.
MSD %R = 2900% } ↑ No action taken since this result was N.D.

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits? 100% 110% 50-150%		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: NO LCSD

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: D-11 = 545B44C } All results N.D.
D-9 = 545B36B

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	X		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes: 545846A was a positive detect result. Confirmed on 2nd column (Pinnacle Cyano) on 01/11/03

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: Ø			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: T2810
Project No.: 15291524.00000

Project Name: Radford SWMU 54
Reviewer: RA
Date: 3/19/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{o}C \pm 2\ ^{o}C$)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes, % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: collected 12/3/4/02 — 4
analyzed 12/13/15/02 ICP; 12/13/02 Hg

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%? <50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K		✓				

Note:

Al 114.2 all 72xCRDL no action
antimony 112.7 K|W
arsenic 115.5, 79.8 K|W, UL|W
chromium 87.8
copper 69.4 all 72xCRDL no action
lead 71.3
nickel 130.4
Sodium 78.6, 75.4 L|W

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L						
4.5	Are there reported field blankor trip blank values > ± MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						

EQB-11 12/4/02 Se 3.4 ug/L pos < 5x B, X

EQB-12 12/4/02 Cr .67 ug/L all 5x no flag

Note: MB → Ba .044 mg/kg, Be -.010, copper .187, Mg 3.948, zinc .233 — all 5x no flag

ICB, CCB pos. Ba, Ca, Mg, neg. Cr. all 5x, no flag

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.		✓			✓	

Note: antimony 200%.

copper 67 lead 115.7% J/UJ/K unless prev.

Hg 113

zinc 39.6%.

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓			✓	
	%R > 125% / 30%< %R < 74% / < 30% Positive: K / L / L Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	✓			✓		

Note: pos antimony 28.8/27.0 | Rim Cr 74.2 Lim Tl 55.8/59.7 UL,m
prev. arsenic 68.6/73.9 Lim Hg 67.6% prev. flag zinc 10.2/18.5 all pos
Copper (-6.8/-21.5) all pos prev. Se 38.6/47.7 Lim prev J,K
J,K

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?						

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note: See attached
J's unless prev.

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		✓		✓		

Note: _____

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓		
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note: _____

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples: 20						
13.1.2	Number of target compounds in each analysis: 23						
13.1.3	Number of results rejected and not reported: 17						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 96%						

Note: _____

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1035

Project Number	Project Name
0760-4310	RFAAP

Project Contact (Name and Phone Number): Darren / Renna

Samplers: Fisher / Spangler

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B39A	12/4/02 845	5		X	S	E		2						X		X							Explosives includes
545B39B	12/4/02 850	5		X	S	E		2						X		X							Nitro Glycerin
545B43A	12/4/02 715	5		X	S	E		2		X	X			X		X							
545B43B	12/4/02 730	5		X	S	E		2		X	X			X		X							
545B43C	12/4/02 945	5		X	S	E		2		X	X			X		X							
545B44A	12/4/02 1000	5		X	S	E		2		X	X			X		X							
545B44B	12/4/02 1010	5		X	S	E		2		X	X			X		X							
545B44C	12/4/02 1020	5		X	S	E		2		X	X			X		X							
D-11	12/4/02 [redacted]	5		X	S	E		2		X	X			X		X							
545B46A	12/4/02 1040	5		X	S	E		3		X	X	X	X	X		X							
545B46B	12/4/02 1050	5		X	S	E		3		X	X	X	X	X		X							
545B46C	12/4/02 1100	5		X	S	E		2		X	X			X		X							

Box #1	Box #2	Box #3	Box #4
1. Surface Water	A. HCl + Ice	F. Ice Only	F. Filtered	R. Rush - 3 Day
2. Ground Water	B. HNO3 + Ice	G. Other _____	U. Unfiltered	S. Standard 28 Day
3. Leachate	C. NaOH + Ice	H. NaHSO4 + Ice		T. Timely 14 Day
4. Rinsate	D. H2SO4 + Ice	I. ZnAc + NaOH + Ice		O. Other _____
5. Soil Sediment/Sludge	E. Unpreserved			
6. Trip Blank				
7. Oil				
8. Waste				
9. Other _____				

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	12/4/02 1800				
Relinquished by:	Date/time	Received by: (for lab) L. Schiller	Date/Time 12/6/02 @ 1020	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1037

Project Number	Project Name
09604310	RFAAP

Project Contact (Name and Phone Number): Darren Rowe

Samplers: Fisher / Spangler

LAB: GEL

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B49A	12/4/02 1115	5		X	S	E		3		X	X	X	X	X		X							Explosives includes
545B49B MS	12/4/02 1115	5		X	S	E		5		X	X	X	Y	X		X							Nitro Glycerin
545B49B MSD	12/4/02 1115	5		X	S	E		3		X	X	X	X	X		X							
545B49 B	12/4/02 1125	5		X	S	E		3		X	X	X	X	X		X							
545B49 C	12/4/02 1135	5		X	S	E	~~F~~	3		X	X			X		X							
545B51 A	12/4/02 1200	5		X	S	E		2		X	X			X		X							
545B51 B	12/4/02 1210	5		X	S	E		2		X	X			X		X							
545B51 C	12/4/02 1220	5		X	S	E		2		X	X			X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	12/4/02 1800				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time: 12/4/02 @ 1020	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

2.0°C

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1089

Project Number	Project Name
09604310	RFAAP

Project Contact (Name and Phone Number): Darren Reese

Samplers: Fisher / Spangler

LAB: G

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B33A	12/3/02 1315	5		X	S	E		3		X	X	X	X	X		X							Explosives includes
545B33B	12/3/02 1325	5		X	S	E		3		X	X	X	X	X		X							Nitro Glycerin
545B33BMS	12/3/02 1325	5		X	S	E		3		X	X	X	X	X		X							
545B33BMSD	12/3/02 1325	5		X	S	E		3		X	X	X	X	X		X							
545B34A	12/3/02 1345	5		X	S	E		2		X	X			X		X							
545B34B	12/3/02 1355	5		X	S	E		2		X	X			X		X							
545B35A	12/3/02 1410	5		X	S	E		1		~~X~~	~~X~~			X		X							Metals/Explosives only
545B35B	12/3/02 1420	5		X	S	E		1		~~X~~	~~X~~			X		X							Metals/Explosives only
545B36A	12/3/02 1430	5		X	S	E		1						X		X							"
545B36B	12/3/02 1440	5		X	S	E		1						X		X							"
D-9	12/3/02	5		X	S	E		1						X		X							"
545B37A	12/3/02 1450	5		X	S	E		1						X		X							
545B37B	12/3/02 1500	5		X	S	E		1						X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	12/3/02 1800				
Relinquished by:	Date/time	Received by: (for lab) Maxine J. Baby	Date/Time 12/4/02 9:00am.		

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

TEMP 2.0°C

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure: poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: _____U2810_____ **Fraction:_SVOCs, Pest., PCBs, PAH, Explosives, Nitroglycerin, Metals_____**

Lab: _CompuChem_____ **Project Name: __Radford SWMU 54_____**

Reviewer: _____RA, AJ_____ **Date: _____March 10, 2003_____**

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the SVOC analyses, the continuing calibrations analyzed on 12/18/02 and 12/19/02 displayed %Ds greater than the QC limit (i.e., 20%) with a negative bias for atrazine at 65.94% and 72.38%, respectively. All associated sample results were non-detects and were flagged "R,c."

For the explosive analyses, the LCS recovery for 1,3,5-trinitrobenzene (43%) was less than the lower QC limit (i.e., 50%). All associated sample results were non-detects and were flagged "R,l."

Minor Anomalies: For the SVOC analyses, the initial calibration analyzed on 12/17/02 displayed RSDs greater than the control limit (i.e., 15%) with a positive bias for benzaldehyde at 15.27%, hexachlorocyclopentadiene at 25.91%, 1,1-biphenyl at 15.11%, 2,4-dinitrophenol at 19.31%, 4-nitrophenol at 19.31%, 2,4-dinitrotoluene at 16.27%, 4-chlorophenyl-phenylether at 17.19%, n-nitosodiphenylamine at 17.9%, atrazine at 86.72%, and benzo(k)fluoranthene at 18.29%. No positive results were reported for these compounds and no data qualifying action was required.

The MS recovery for atrazine (180%) was greater than the upper QC limit. These results were previously flagged due to calibration failure and no further data qualifying action was required.

For the pesticides analyses, the CCV analyzed on 12/16/02 at 1956 displayed a %D greater than the QC limit (i.e., 15%) with a positive bias for endosulfan II at 16.72%. The CCV analyzed on 12/17/02 at 0211 displayed %Ds greater than the QC limit with a positive bias for delta-BHC at 21.35%, gamma-BHC at 16.11%, 4,4-DDD at 18.58%, 4,4-DDT at 18.27%, endrin at 17.51%, and endrin aldehyde at 16.07%. Positive results were flagged "J,c" in the associated samples.

The MS/MSD recoveries for beta-BHC (421%/355%), 4,4-DDD (242%/210%), 4,4-DDT (158%/153%), and the MS recoveries for endosulfan II (168%) and alpha-chlordane (158%) were greater than the upper QC limits. No positive results were reported for these compounds in the parent sample 54SB55B and no data qualifying action was required.

The LCS recoveries for 4,4-DDD (240%) and endosulfan II (160%) were greater than the upper QC limits. No positive results were reported for these compounds and no data qualifying action was required.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for some compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

For the PAH analyses, the RPD for the MS/MSD analyses for acenaphthene (22%) was greater than the QC limit. The positive naphthalene result was flagged "J,d" in the parent sample 54SB41A.

Naphthalene and acenaphthene results were outside the QC limit for the field duplicate pair D-12/54SB55A. No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for some compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

For the explosives analyses, the continuing calibration analyzed on 12/31/02 at 0756 displayed a %D greater than the QC limit (i.e., 15%) with a positive bias for 2,4-dinitrotoluene at 18.31%. The continuing calibration analyzed on 12/31/02 at 1853 displayed a %D greater than the QC limit with a positive bias for 2,4,6-dinitrotoluene at 30.79%. The continuing calibration analyzed on 1/1/03 at 0410 displayed %Ds greater than the QC limit with a positive bias for 2,4,6-dinitrotoluene at 29.58% and 2,4-dinitrotoluene at 25.22%. The continuing calibration analyzed on 1/1/03 at 1241 displayed a %D greater than the QC limit with a positive bias for 2,4-dinitrotoluene at 28.12%. The continuing calibrations analyzed on 1/6/03 at 1129 and 2306 displayed %Ds greater than the QC limit with a negative bias for 3-nitrotoluene at 27.24% and 27.89%, respectively. No positive results were reported for the compounds associated with the positive biases and no data flags were applied. No data flags were applied to the non-detects associated with negative biases since the %Ds were acceptable on the alternate column.

The MS/MSD recoveries for 1,3,5-trinitrobenzene (8%/0%) were less than the lower QC limit. This result was previously flagged due to LCS failure in the

parent sample 54SB41A and no further data qualifying action was required. The %RPD for 4-amino-2,6-dinitrotoluene (58%) was greater than the QC limit. No positive results were reported and no data qualifying action was required

For the metal analyses, the method blank contained barium at 0.047 mg/Kg, calcium at 1.133 mg/Kg, magnesium at 6.796 mg/Kg, and zinc at 0.296 mg/Kg. All associated sample results were greater than 5 times the blank concentration and no data qualifying action was required.

Equipment blank EQB-14 located in SDG R2810 contained copper at 1.6 ug/L and selenium at 3.7 ug/L. Equipment blank EQB-12 located in SDG R2810 contained chromium at 0.67 ug/L. Positive results less than 5 times the blank concentration were flagged "B.x" in the associated samples.

The initial and continuing calibration blanks also displayed a negative result for arsenic and positive results for barium, beryllium, calcium and magnesium. All associated sample results were positive and were greater than 5 times the blank concentration. No data qualifying action was required.

The initial CRDL percent recoveries for aluminum (114.2%), antimony (112.7%), arsenic (79.8%), copper (69.4%), lead (71.3%), nickel (130.4%), and sodium (75.4%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "L,w" and non-detects were flagged "UL,w" for arsenic, copper and sodium in the associated samples. All associated sample results were greater than 2xCRDL for the other analytes and no further data qualifying action was required.

The %RPDs for laboratory duplicates were greater than the QC limit (i.e., 35%) for lead (129%) and zinc (39.8%). Positive results were flagged "J,k" in the associated samples.

The MS and or MSD recoveries for antimony (32%/34.8%), arsenic (74.5%), selenium (73.1%), thallium (63.6%), and zinc (63.6%/68.9%) were less than the lower QC limit. Positive results were flagged "L,m" and non-detects were flagged "UL,m" unless previously flagged due to other anomalies.

The %Ds for serial dilution analyses were greater than the QC limit (i.e., 10%) for all analytes except aluminum, antimony, arsenic, cadmium, selenium, silver and sodium. Positive results were flagged "J,s" unless previously flagged due to other anomalies.

Aluminum, copper, and mercury results were outside the QC limits for the field duplicate pair D-12/54SB55A. The results for all analytes except calcium and selenium were outside the QC limits for the field duplicate pair D-13/54SB47B.

No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

Correctable Anomalies: The sample ID for D-13 was incorrectly reported as DUP-13 by the laboratory. Correction was made on the Form Is by the reviewer.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were raised. The chain of custodies were not signed by the laboratory. No data qualifying action was taken.

Positive TIC results were flagged "NJ,t" in the associated samples. It should be noted that if a given fraction (analysis) is not discussed in this report, it indicates that no anomalies were observed for that fraction. Except for data flagged "R", all data, as qualified, are usable for their intended purpose based on the data reviewed.

Signed: Ranjan

SAMPLENUM	CLIENTID	QUOTENUM	REF (COC #)	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
U2810-19	54SB41A	Q2810	1039	U2810	SO	URS	RADFORD SWMU 54	12/11/02
U2810-20	54SB41B	Q2810	1039	U2810	SO	URS	RADFORD SWMU 54	12/11/02
U2810-14	54SB45A	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-15	54SB45B	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-16	54SB47A	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-17	54SB47B	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-10	54SB48A	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-11	54SB48B	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-1	54SB49C	Q2810	1037	U2810	SO	URS	RADFORD SWMU 54	12/6/02
U2810-8	54SB50A	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-9	54SB50B	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-2	54SB51A	Q2810	1037	U2810	SO	URS	RADFORD SWMU 54	12/6/02
U2810-3	54SB51B	Q2810	1037	U2810	SO	URS	RADFORD SWMU 54	12/6/02
U2810-4	54SB51C	Q2810	1037	U2810	SO	URS	RADFORD SWMU 54	12/6/02
U2810-12	54SB54A	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-13	54SB54B	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-5	54SB55A	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-7	54SB55B	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-6	D-12	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02
U2810-18	DUP-13	Q2810	1047	U2810	SO	URS	RADFORD SWMU 54	12/10/02

↑ on COC D-13

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB41A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-19A64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 24 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	430	U
108-95-2	Phenol	430	U
111-44-4	Bis(2-chloroethyl)ether	430	U
95-57-8	2-Chlorophenol	430	U
95-48-7	2-Methylphenol	430	U
108-60-1	2,2'-oxybis(1-Chloropropane)	430	U
98-86-2	Acetophenone	430	U
106-44-5	4-Methylphenol	430	U
621-64-7	N-Nitroso-di-N-propylamine	430	U
67-72-1	Hexachloroethane	430	U
98-95-3	Nitrobenzene	430	U
78-59-1	Isophorone	430	U
88-75-5	2-Nitrophenol	430	U
105-67-9	2,4-Dimethylphenol	430	U
111-91-1	Bis(2-chloroethoxy)methane	430	U
120-83-2	2,4-Dichlorophenol	430	U
91-20-3	Naphthalene	430	U
106-47-8	4-Chloroaniline	430	U
87-68-3	Hexachlorobutadiene	430	U
105-60-2	Caprolactam	430	U
59-50-7	4-Chloro-3-methylphenol	430	U
91-57-6	2-Methylnaphthalene	430	U
77-47-4	Hexachlorocyclopentadiene	430	U
88-06-2	2,4,6-Trichlorophenol	430	U
95-95-4	2,4,5-Trichlorophenol	430	U
92-52-4	1,1'-Biphenyl	430	U
91-58-7	2-Chloronaphthalene	430	U
88-74-4	2-Nitroaniline	870	U
131-11-3	Dimethylphthalate	430	U
606-20-2	2,6-Dinitrotoluene	430	U
208-96-8	Acenaphthylene	430	U
99-09-2	3-Nitroaniline	870	U
83-32-9	Acenaphthene	430	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB41A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-19A64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 24 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	870	U
121-14-2	2,4-Dinitrotoluene	430	U
132-64-9	Dibenzofuran	430	U
84-66-2	Diethylphthalate	430	U
7005-72-3	4-Chlorophenyl-phenylether	430	U
86-73-7	Fluorene	430	U
100-01-6	4-Nitroaniline	870	U
534-52-1	4,6-Dinitro-2-methylphenol	870	U
86-30-6	N-Nitrosodiphenylamine (1)	430	U
101-55-3	4-Bromophenyl-phenylether	430	U
118-74-1	Hexachlorobenzene	430	U
1912-24-9	Atrazine	430	UR/C
87-86-5	Pentachlorophenol	430	U
85-01-8	Phenanthrene	430	U
120-12-7	Anthracene	430	U
86-74-8	Carbazole	430	U
84-74-2	Di-n-butylphthalate	430	U
206-44-0	Fluoranthene	430	U
129-00-0	Pyrene	430	U
85-68-7	Butylbenzylphthalate	430	U
91-94-1	3,3'-Dichlorobenzidine	430	U
117-81-7	bis(2-ethylhexyl)Phthalate	50	J
56-55-3	Benzo(a)anthracene	430	U
218-01-9	Chrysene	430	U
117-84-0	Di-n-octylphthalate	430	U
205-99-2	Benzo(b)fluoranthene	430	U
207-08-9	Benzo(k)fluoranthene	430	U
50-32-8	Benzo(a)pyrene	430	U
193-39-5	Indeno(1,2,3-cd)pyrene	430	U
53-70-3	Dibenzo(a,h)anthracene	430	U
191-24-2	Benzo(g,h,i)perylene	430	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB41A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-19A64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 24 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.34	420	JB
2.		UNKNOWN (BC)	5.62	770	JB
3.		UNKNOWN (BC)	6.88	210	JB
4.		UNKNOWN AMIDE	16.68	180	J
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
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26.					
27.					
28.					
29.					
30.					

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB41B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-20A64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 9 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	360	U
108-95-2	Phenol	360	U
111-44-4	Bis(2-chloroethyl)ether	360	U
95-57-8	2-Chlorophenol	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
98-86-2	Acetophenone	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-di-N-propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	Bis(2-chloroethoxy)methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
105-60-2	Caprolactam	360	U
59-50-7	4-Chloro-3-methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	360	U
92-52-4	1,1'-Biphenyl	360	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	730	U
131-11-3	Dimethylphthalate	360	U
606-20-2	2,6-Dinitrotoluene	360	U
208-96-8	Acenaphthylene	360	U
99-09-2	3-Nitroaniline	730	U
83-32-9	Acenaphthene	360	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB41B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-20A64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 9 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1800	U
100-02-7	4-Nitrophenol	730	U
121-14-2	2,4-Dinitrotoluene	360	U
132-64-9	Dibenzofuran	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	730	U
534-52-1	4,6-Dinitro-2-methylphenol	730	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
1912-24-9	Atrazine	360	U R,C
87-86-5	Pentachlorophenol	360	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-butylphthalate	360	U
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
117-81-7	bis(2-ethylhexyl)Phthalate	360	U
56-55-3	Benzo(a)anthracene	360	U
218-01-9	Chrysene	360	U
117-84-0	Di-n-octylphthalate	360	U
205-99-2	Benzo(b)fluoranthene	360	U
207-08-9	Benzo(k)fluoranthene	360	U
50-32-8	Benzo(a)pyrene	360	U
193-39-5	Indeno(1,2,3-cd)pyrene	360	U
53-70-3	Dibenzo(a,h)anthracene	360	U
191-24-2	Benzo(g,h,i)perylene	360	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB41B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-20A64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 9 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.34~~	~~350~~	~~JB~~
2.	110-74-7	FORMIC ACID, PROPYL ESTER	5.63	650	NJ NJ, E
3.					
4.					
5.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB45A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-14A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	760	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	760	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB45A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-14A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	760	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	760	U
534-52-1	4,6-Dinitro-2-methylphenol	760	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U RIC
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB45A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-14A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.34	330	JB
2.		UNKNOWN (BC)	~~5.62~~	580	JB
3.		~~UNKNOWN~~	16.32	240	J
4.	6624-79-9	1-DOTRIACONTANOL	19.93	380	NJ NJ
5.		~~UNKNOWN~~	22.08	210	J
6.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB45B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-15A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	770	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	770	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB45B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-15A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 14 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	770	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	770	U
534-52-1	4,6-Dinitro-2-methylphenol	770	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U R, C
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB45B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-15A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.34	~~300~~	JB
2.	110-74-7	FORMIC ACID, PROPYL ESTER	5.62	540	NJ UJ
3.					
4.					
5.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB47A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-16A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB47A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-16A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R,C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB47A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-16A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~ (BC)	5.33	420	JB
2.		UNKNOWN (BC)	5.63	740	JB
3.		UNKNOWN	9.13	290	J
4.		~~UNKNOWN~~	18.41	380	J
5.	83-47-6	.GAMMA.-SITOSTEROL	22.08	180	NJ NJ
6.		~~UNKNOWN~~	22.81	160	J
7.	73285-35-5	(7R,8S)-CIS-ANTI-CIS-7,8-EPO	22.87	160	NJ NJ
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB47B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-17A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 9 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	360	U
108-95-2	Phenol	360	U
111-44-4	Bis(2-chloroethyl)ether	360	U
95-57-8	2-Chlorophenol	360	U
95-48-7	2-Methylphenol	360	U
108-60-1	2,2'-oxybis(1-Chloropropane)	360	U
98-86-2	Acetophenone	360	U
106-44-5	4-Methylphenol	360	U
621-64-7	N-Nitroso-di-N-propylamine	360	U
67-72-1	Hexachloroethane	360	U
98-95-3	Nitrobenzene	360	U
78-59-1	Isophorone	360	U
88-75-5	2-Nitrophenol	360	U
105-67-9	2,4-Dimethylphenol	360	U
111-91-1	Bis(2-chloroethoxy)methane	360	U
120-83-2	2,4-Dichlorophenol	360	U
91-20-3	Naphthalene	360	U
106-47-8	4-Chloroaniline	360	U
87-68-3	Hexachlorobutadiene	360	U
105-60-2	Caprolactam	360	U
59-50-7	4-Chloro-3-methylphenol	360	U
91-57-6	2-Methylnaphthalene	360	U
77-47-4	Hexachlorocyclopentadiene	360	U
88-06-2	2,4,6-Trichlorophenol	360	U
95-95-4	2,4,5-Trichlorophenol	360	U
92-52-4	1,1'-Biphenyl	360	U
91-58-7	2-Chloronaphthalene	360	U
88-74-4	2-Nitroaniline	730	U
131-11-3	Dimethylphthalate	360	U
606-20-2	2,6-Dinitrotoluene	360	U
208-96-8	Acenaphthylene	360	U
99-09-2	3-Nitroaniline	730	U
83-32-9	Acenaphthene	360	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB47B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-17A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 9 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1800	U
100-02-7	4-Nitrophenol	730	U
121-14-2	2,4-Dinitrotoluene	360	U
132-64-9	Dibenzofuran	360	U
84-66-2	Diethylphthalate	360	U
7005-72-3	4-Chlorophenyl-phenylether	360	U
86-73-7	Fluorene	360	U
100-01-6	4-Nitroaniline	730	U
534-52-1	4,6-Dinitro-2-methylphenol	730	U
86-30-6	N-Nitrosodiphenylamine (1)	360	U
101-55-3	4-Bromophenyl-phenylether	360	U
118-74-1	Hexachlorobenzene	360	U
1912-24-9	Atrazine	360	U R
87-86-5	Pentachlorophenol	360	U
85-01-8	Phenanthrene	360	U
120-12-7	Anthracene	360	U
86-74-8	Carbazole	360	U
84-74-2	Di-n-butylphthalate	360	U
206-44-0	Fluoranthene	360	U
129-00-0	Pyrene	360	U
85-68-7	Butylbenzylphthalate	360	U
91-94-1	3,3'-Dichlorobenzidine	360	U
117-81-7	bis(2-ethylhexyl)Phthalate	360	U
56-55-3	Benzo(a)anthracene	360	U
218-01-9	Chrysene	360	U
117-84-0	Di-n-octylphthalate	360	U
205-99-2	Benzo(b)fluoranthene	360	U
207-08-9	Benzo(k)fluoranthene	360	U
50-32-8	Benzo(a)pyrene	360	U
193-39-5	Indeno(1,2,3-cd)pyrene	360	U
53-70-3	Dibenzo(a,h)anthracene	360	U
191-24-2	Benzo(g,h;i)perylene	360	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB47B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-17A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 9 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.34	330	JB
2.	110-74-7	FORMIC ACID, PROPYL ESTER	5.62	600	NJ
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB48A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-10A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB48A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-10A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	220	J
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U R/C
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	44	J
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	86	J
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB48A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-10A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.33	300	JB
2.		UNKNOWN (BC)	5.62	550	JB
3.		UNKNOWN (BC)	6.87	190	JB
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB48B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-11A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 14 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	770	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	770	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB48B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-11A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 14 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	770	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	770	U
534-52-1	4,6-Dinitro-2-methylphenol	770	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U R,C
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB48B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-11A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.33	240	JB
2.		UNKNOWN (BC)	5.61	440	JB
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB49C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-1B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 24 decanted: (Y/N) Y Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	430	U
108-95-2	Phenol	430	U
111-44-4	Bis(2-chloroethyl)ether	430	U
95-57-8	2-Chlorophenol	430	U
95-48-7	2-Methylphenol	430	U
108-60-1	2,2'-oxybis(1-Chloropropane)	430	U
98-86-2	Acetophenone	430	U
106-44-5	4-Methylphenol	430	U
621-64-7	N-Nitroso-di-N-propylamine	430	U
67-72-1	Hexachloroethane	430	U
98-95-3	Nitrobenzene	430	U
78-59-1	Isophorone	430	U
88-75-5	2-Nitrophenol	430	U
105-67-9	2,4-Dimethylphenol	430	U
111-91-1	Bis(2-chloroethoxy)methane	430	U
120-83-2	2,4-Dichlorophenol	430	U
91-20-3	Naphthalene	430	U
106-47-8	4-Chloroaniline	430	U
87-68-3	Hexachlorobutadiene	430	U
105-60-2	Caprolactam	430	U
59-50-7	4-Chloro-3-methylphenol	430	U
91-57-6	2-Methylnaphthalene	430	U
77-47-4	Hexachlorocyclopentadiene	430	U
88-06-2	2,4,6-Trichlorophenol	430	U
95-95-4	2,4,5-Trichlorophenol	430	U
92-52-4	1,1'-Biphenyl	430	U
91-58-7	2-Chloronaphthalene	430	U
88-74-4	2-Nitroaniline	870	U
131-11-3	Dimethylphthalate	430	U
606-20-2	2,6-Dinitrotoluene	430	U
208-96-8	Acenaphthylene	430	U
99-09-2	3-Nitroaniline	870	U
83-32-9	Acenaphthene	430	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB49C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-1B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 24 decanted: (Y/N) Y Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2200	U
100-02-7	4-Nitrophenol	870	U
121-14-2	2,4-Dinitrotoluene	430	U
132-64-9	Dibenzofuran	430	U
84-66-2	Diethylphthalate	430	U
7005-72-3	4-Chlorophenyl-phenylether	430	U
86-73-7	Fluorene	430	U
100-01-6	4-Nitroaniline	870	U
534-52-1	4,6-Dinitro-2-methylphenol	870	U
86-30-6	N-Nitrosodiphenylamine (1)	430	U
101-55-3	4-Bromophenyl-phenylether	430	U
118-74-1	Hexachlorobenzene	430	U
1912-24-9	Atrazine	430	U R1C
87-86-5	Pentachlorophenol	430	U
85-01-8	Phenanthrene	430	U
120-12-7	Anthracene	430	U
86-74-8	Carbazole	430	U
84-74-2	Di-n-butylphthalate	430	U
206-44-0	Fluoranthene	430	U
129-00-0	Pyrene	430	U
85-68-7	Butylbenzylphthalate	430	U
91-94-1	3,3'-Dichlorobenzidine	430	U
117-81-7	bis(2-ethylhexyl)Phthalate	88	J
56-55-3	Benzo(a)anthracene	430	U
218-01-9	Chrysene	430	U
117-84-0	Di-n-octylphthalate	430	U
205-99-2	Benzo(b)fluoranthene	430	U
207-08-9	Benzo(k)fluoranthene	430	U
50-32-8	Benzo(a)pyrene	430	U
193-39-5	Indeno(1,2,3-cd)pyrene	430	U
53-70-3	Dibenzo(a,h)anthracene	430	U
191-24-2	Benzo(g,h,i)perylene	430	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB49C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-1B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 24 decanted: (Y/N) Y Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.32	400	JB
2.		UNKNOWN (BC)	5.61	700	JB
3.		UNKNOWN (BC)	6.86	270	JB
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB50A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-8A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB50A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-8A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 21 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	840	U
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	420	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	UR,C
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	420	U
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	U
206-44-0	Fluoranthene	420	U
129-00-0	Pyrene	420	U
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	200	J
56-55-3	Benzo(a)anthracene	420	U
218-01-9	Chrysene	420	U
117-84-0	Di-n-octylphthalate	420	U
205-99-2	Benzo(b)fluoranthene	420	U
207-08-9	Benzo(k)fluoranthene	420	U
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	420	U
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	420	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB50A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-8A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 11

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.33	390	JB
2.		UNKNOWN (BC)	5.62	650	JB
3.	79-92-5	CAMPHENE	5.65	260	NJ
4.		UNKNOWN	8.85	220	J
5.		UNKNOWN	9.13	960	J
6.		UNKNOWN	9.26	330	J
7.		UNKNOWN	9.31	170	J
8.		UNKNOWN	18.40	1600	J
9.		UNKNOWN	19.58	190	J
10.	57-88-5	CHOLESTEROL	21.16	670	NJ
11.		UNKNOWN	23.46	320	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB50B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-9A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	760	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	760	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB50B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-9A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	760	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	760	U
534-52-1	4,6-Dinitro-2-methylphenol	760	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U RIC
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB50B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-9A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 13 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.33	320	JB
2.		UNKNOWN (BC)	5.62	610	JB
3.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB51A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-2B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB51A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-2B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	810	U
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	36	J
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	810	U
534-52-1	4,6-Dinitro-2-methylphenol	810	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	UR,C
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	410	U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	410	U
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-octylphthalate	410	U
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB51A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-2B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.33	340	JB
2.		UNKNOWN (BC)	5.61	630	JB
3.		UNKNOWN	19.57	170	J
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB51B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-3B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	770	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	770	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB51B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-3B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	770	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	770	U
534-52-1	4,6-Dinitro-2-methylphenol	770	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U R,C
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB51B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-3B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 14 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.32	280	JB
2.		UNKNOWN (BC)	5.61	530	JB
3.					
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB51C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-4B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB51C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-4B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	UR,C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB51C

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-4B64

Level: (low/med) LOW Date Received: 12/06/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.32	350	JB
2.		UNKNOWN (BC)	5.61	660	JB
3.		UNKNOWN (BC)	6.87	170	JB
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB54A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-12A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB54A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-12A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	94	J
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	UR IC
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	120	J
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB54A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-12A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.33	340	JB
2.		UNKNOWN (BC)	5.62	660	JB
3.		UNKNOWN	21.76	220	J
4.					
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB54B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-13A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB54B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-13A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	390	U
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U RIC
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	390	U
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB54B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-13A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.33	350	JB
2.		~~UNKNOWN~~ (BC)	5.62	640	JB
3.					
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB55A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-5B64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB55A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-5B64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R1C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB55A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-5B64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.32	350	JB
2.		UNKNOWN (BC)	5.61	650	JB
3.		UNKNOWN (BC)	6.86	290	JB
4.		UNKNOWN	21.30	230	J
5.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB55B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-7A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	750	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	750	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB55B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-7A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	750	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	750	U
534-52-1	4,6-Dinitro-2-methylphenol	750	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U R/C
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB55B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-7A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.32	450	JB
2.		UNKNOWN (BC)	5.61	760	JB
3.					
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-12

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-6B64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-12

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-6B64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U RIC
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-12

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-6B64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 17 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.32	300	JB
2.		UNKNOWN (BC)	5.61	550	JB
3.		UNKNOWN (BC)	6.88	240	JB
4.		UNKNOWN	9.12	270	J
5.		STRAIGHT-CHAIN ALKANE	15.57	170	J
6.		UNKNOWN	18.40	1000	J
7.		UNKNOWN	21.31	210	J
8.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

~~DUP-13~~ D-13

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810 RA 3/4/03

Matrix: (soil/water) SOIL Lab Sample ID: U2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-18A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

~~DUP-13~~ D-13

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810 RA

Matrix: (soil/water) SOIL Lab Sample ID: U2810-18 3/4/03

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-18A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R,C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

~~DUP-13~~ D-13

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810 RA

Matrix: (soil/water) SOIL Lab Sample ID: U2810-18 3/4/03

Sample wt/vol: 30.0 (g/mL) G Lab File ID: U2810-18A64

Level: (low/med) LOW Date Received: 12/10/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/13/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/19/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.34~~	~~380~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~5.62~~	~~680~~	~~JB~~
3.					
4.					
5.					
6.					
7.					
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9.					
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29.					
30.					

FORM I SV-TIC

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB48A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/16/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.99	U
319-84-6	alpha-BHC	0.99	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	0.99	U
58-89-9	gamma-BHC (Lindane)	0.99	U
72-54-8	4,4'-DDD	3.9	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	6.0	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.9	U
1031-07-8	Endosulfan sulfate	3.9	U
72-20-8	Endrin	3.9	U
7421-93-4	Endrin Aldehyde	3.9	U
76-44-8	Heptachlor	0.99	U
1024-57-3	Heptachlor Epoxide	0.99	U
72-43-5	Methoxychlor	9.9	U
8001-35-2	Toxaphene	99	U
12674-11-2	Aroclor-1016	77	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	77	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Aroclor-1254	54	U
11096-82-5	Aroclor-1260	77	U
53494-70-5	Endrin Ketone	9.9	U
5103-74-2	gamma-Chlordane	0.99	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB48B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/17/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NC.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.97	U
319-84-6	alpha-BHC	0.83	J
319-85-7	beta-BHC	3.5	P JJC
319-86-8	delta-BHC	1.2	JJC
58-89-9	gamma-BHC (Lindane)	1.1	P JJC
72-54-8	4,4'-DDD	3.8	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	5.8	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	3.8	U
1031-07-8	Endosulfan sulfate	3.8	U
72-20-8	Endrin	3.8	U
7421-93-4	Endrin Aldehyde	3.8	U
76-44-8	Heptachlor	0.97	U
1024-57-3	Heptachlor Epoxide	0.97	U
72-43-5	Methoxychlor	9.7	U
8001-35-2	Toxaphene	97	U
12674-11-2	Aroclor-1016	76	U
11104-28-2	Aroclor-1221	99	U
11141-16-5	Aroclor-1232	76	U
53469-21-9	Aroclor-1242	52	U
12672-29-6	Aroclor-1248	52	U
11097-69-1	Aroclor-1254	52	U
11096-82-5	Aroclor-1260	76	U
53494-70-5	Endrin Ketone	9.7	U
5103-74-2	gamma-Chlordane	0.97	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB55A

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/16/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	6.0	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	4.0	U
1031-07-8	Endosulfan sulfate	4.0	U
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	5.9	
72-43-5	Methoxychlor	10	U
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	78	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	78	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Aroclor-1254	54	U
11096-82-5	Aroclor-1260	78	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB55B

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 12 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/16/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	0.94	U
319-84-6	alpha-BHC	0.94	U
319-85-7	beta-BHC	1.9	U
319-86-8	delta-BHC	0.94	U
58-89-9	gamma-BHC (Lindane)	0.94	U
72-54-8	4,4'-DDD	3.8	U
72-55-9	4,4'-DDE	1.9	U
50-29-3	4,4'-DDT	5.7	U
60-57-1	Dieldrin	1.9	U
959-98-8	Endosulfan I	1.9	U
33213-65-9	Endosulfan II	3.8	U
1031-07-8	Endosulfan sulfate	3.8	U
72-20-8	Endrin	3.8	U
7421-93-4	Endrin Aldehyde	3.8	U
76-44-8	Heptachlor	0.94	U
1024-57-3	Heptachlor Epoxide	3.3	P J/C
72-43-5	Methoxychlor	9.4	U
8001-35-2	Toxaphene	94	U
12674-11-2	Aroclor-1016	74	U
11104-28-2	Aroclor-1221	97	U
11141-16-5	Aroclor-1232	74	U
53469-21-9	Aroclor-1242	51	U
12672-29-6	Aroclor-1248	51	U
11097-69-1	Aroclor-1254	51	U
11096-82-5	Aroclor-1260	74	U
53494-70-5	Endrin Ketone	9.4	U
5103-74-2	gamma-Chlordane	0.94	U
5103-71-9	alpha-Chlordane	1.9	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-12

Lab Name: COMPUCHEM Contract: 8081A

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(uL) Date Analyzed: 12/16/02

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
309-00-2	Aldrin	1.0	U
319-84-6	alpha-BHC	1.0	U
319-85-7	beta-BHC	2.0	U
319-86-8	delta-BHC	1.0	U
58-89-9	gamma-BHC (Lindane)	1.0	U
72-54-8	4,4'-DDD	4.0	U
72-55-9	4,4'-DDE	2.0	U
50-29-3	4,4'-DDT	6.0	U
60-57-1	Dieldrin	2.0	U
959-98-8	Endosulfan I	2.0	U
33213-65-9	Endosulfan II	4.0	U
1031-07-8	Endosulfan sulfate	4.0	U
72-20-8	Endrin	4.0	U
7421-93-4	Endrin Aldehyde	4.0	U
76-44-8	Heptachlor	1.0	U
1024-57-3	Heptachlor Epoxide	4.8	
72-43-5	Methoxychlor	10	U
8001-35-2	Toxaphene	100	U
12674-11-2	Aroclor-1016	78	U
11104-28-2	Aroclor-1221	100	U
11141-16-5	Aroclor-1232	78	U
53469-21-9	Aroclor-1242	54	U
12672-29-6	Aroclor-1248	54	U
11097-69-1	Aroclor-1254	54	U
11096-82-5	Aroclor-1260	78	U
53494-70-5	Endrin Ketone	10	U
5103-74-2	gamma-Chlordane	1.0	U
5103-71-9	alpha-Chlordane	2.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB41A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-19

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 24 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	89	P J,d
83-32-9	Acenaphthene	96	P J,d
86-73-7	Fluorene	55	U
129-00-0	Pyrene	22	U
85-01-8	Phenanthrene	55	U
120-12-7	Anthracene	55	U
206-44-0	Fluoranthene	9.2	J
218-01-9	Chrysene	11	U
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	6.9	J
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	55	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB41B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-20

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 9 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	46	U
83-32-9	Acenaphthene	46	U
86-73-7	Fluorene	46	U
129-00-0	Pyrene	25	P J,Z
85-01-8	Phenanthrene	46	U
120-12-7	Anthracene	46	U
206-44-0	Fluoranthene	19	U
218-01-9	Chrysene	9.1	U
205-99-2	Benzo(b)fluoranthene	9.1	U
207-08-9	Benzo(k)fluoranthene	9.1	U
53-70-3	Dibenzo(a,h)anthracene	9.1	U
191-24-2	Benzo(g,h,i)perylene	9.1	U
56-55-3	Benzo(a)anthracene	9.1	U
50-32-8	Benzo(a)pyrene	9.1	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.1	U
208-96-8	Acenaphthylene	46	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB45A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-14

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 13 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	48	U
83-32-9	Acenaphthene	48	U
86-73-7	Fluorene	48	U
129-00-0	Pyrene	14	JP J,q
85-01-8	Phenanthrene	48	U
120-12-7	Anthracene	48	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.5	U
205-99-2	Benzo(b)fluoranthene	9.5	U
207-08-9	Benzo(k)fluoranthene	9.5	U
53-70-3	Dibenzo(a,h)anthracene	9.5	U
191-24-2	Benzo(g,h,i)perylene	9.5	U
56-55-3	Benzo(a)anthracene	9.5	U
50-32-8	Benzo(a)pyrene	9.5	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.5	U
208-96-8	Acenaphthylene	48	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB45B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-15

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	21	P J,8
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.6	U
205-99-2	Benzo(b)fluoranthene	9.6	U
207-08-9	Benzo(k)fluoranthene	9.6	U
53-70-3	Dibenzo(a,h)anthracene	9.6	U
191-24-2	Benzo(g,h,i)perylene	9.6	U
56-55-3	Benzo(a)anthracene	9.6	U
50-32-8	Benzo(a)pyrene	9.6	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.6	U
208-96-8	Acenaphthylene	49	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB47A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-16

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	13	JP J/g
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB47B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-17

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 9 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	46	U
83-32-9	Acenaphthene	46	U
86-73-7	Fluorene	46	U
129-00-0	Pyrene	7.6	J
85-01-8	Phenanthrene	46	U
120-12-7	Anthracene	46	U
206-44-0	Fluoranthene	19	U
218-01-9	Chrysene	9.1	U
205-99-2	Benzo(b)fluoranthene	9.1	U
207-08-9	Benzo(k)fluoranthene	9.1	U
53-70-3	Dibenzo(a,h)anthracene	9.1	U
191-24-2	Benzo(g,h,i)perylene	9.1	U
56-55-3	Benzo(a)anthracene	9.1	U
50-32-8	Benzo(a)pyrene	9.1	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.1	U
208-96-8	Acenaphthylene	46	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB48A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	140	P J/B
83-32-9	Acenaphthene	50	U
86-73-7	Fluorene	50	U
129-00-0	Pyrene	10	J
85-01-8	Phenanthrene	50	U
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	4.3	J
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	19	
207-08-9	Benzo(k)fluoranthene	9.9	U
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	9.9	U
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	50	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB48B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	16	JP J,a
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.6	U
205-99-2	Benzo(b)fluoranthene	9.6	U
207-08-9	Benzo(k)fluoranthene	9.6	U
53-70-3	Dibenzo(a,h)anthracene	9.6	U
191-24-2	Benzo(g,h,i)perylene	9.6	U
56-55-3	Benzo(a)anthracene	9.6	U
50-32-8	Benzo(a)pyrene	9.6	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.6	U
208-96-8	Acenaphthylene	49	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 24 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	55	U
83-32-9	Acenaphthene	55	U
86-73-7	Fluorene	55	U
129-00-0	Pyrene	10	J
85-01-8	Phenanthrene	55	U
120-12-7	Anthracene	55	U
206-44-0	Fluoranthene	22	U
218-01-9	Chrysene	11	U
205-99-2	Benzo(b)fluoranthene	11	U
207-08-9	Benzo(k)fluoranthene	11	U
53-70-3	Dibenzo(a,h)anthracene	11	U
191-24-2	Benzo(g,h,i)perylene	11	U
56-55-3	Benzo(a)anthracene	11	U
50-32-8	Benzo(a)pyrene	11	U
193-39-5	Indeno(1,2,3-cd)pyrene	11	U
208-96-8	Acenaphthylene	55	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB50A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 21 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	53	U
83-32-9	Acenaphthene	53	U
86-73-7	Fluorene	53	U
129-00-0	Pyrene	65	P J,g
85-01-8	Phenanthrene	53	U
120-12-7	Anthracene	53	U
206-44-0	Fluoranthene	7.2	JP J,g
218-01-9	Chrysene	13	P
205-99-2	Benzo(b)fluoranthene	32	P
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	84	P J,g
56-55-3	Benzo(a)anthracene	13	P
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	53	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB50B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 13 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	48	U
83-32-9	Acenaphthene	48	U
86-73-7	Fluorene	48	U
129-00-0	Pyrene	8.7	J
85-01-8	Phenanthrene	48	U
120-12-7	Anthracene	48	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.5	U
205-99-2	Benzo(b)fluoranthene	9.5	U
207-08-9	Benzo(k)fluoranthene	9.5	U
53-70-3	Dibenzo(a,h)anthracene	9.5	U
191-24-2	Benzo(g,h,i)perylene	9.5	U
56-55-3	Benzo(a)anthracene	9.5	U
50-32-8	Benzo(a)pyrene	9.5	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.5	U
208-96-8	Acenaphthylene	48	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB51A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/24/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	52	U
83-32-9	Acenaphthene	52	U
86-73-7	Fluorene	52	U
129-00-0	Pyrene	17	JPJ,J
85-01-8	Phenanthrene	52	U
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	12	JP J,J
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	52	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB51B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 14 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	49	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.6	U
205-99-2	Benzo(b)fluoranthene	9.6	U
207-08-9	Benzo(k)fluoranthene	9.6	U
53-70-3	Dibenzo(a,h)anthracene	9.6	U
191-24-2	Benzo(g,h,i)perylene	9.6	U
56-55-3	Benzo(a)anthracene	9.6	U
50-32-8	Benzo(a)pyrene	9.6	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.6	U
208-96-8	Acenaphthylene	49	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB51C

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB54A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-12

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB54B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-13

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/26/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	50	U
83-32-9	Acenaphthene	26	JP J/J
86-73-7	Fluorene	50	U
129-00-0	Pyrene	20	JP J/J
85-01-8	Phenanthrene	12	J
120-12-7	Anthracene	13	J
206-44-0	Fluoranthene	13	J
218-01-9	Chrysene	13	
205-99-2	Benzo(b)fluoranthene	14	
207-08-9	Benzo(k)fluoranthene	15	
53-70-3	Dibenzo(a,h)anthracene	11	
191-24-2	Benzo(g,h,i)perylene	12	
56-55-3	Benzo(a)anthracene	12	
50-32-8	Benzo(a)pyrene	11	
193-39-5	Indeno(1,2,3-cd)pyrene	14	
208-96-8	Acenaphthylene	50	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB55A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	410	
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	5.0	JP J/g
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB55B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 12 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	48	U
83-32-9	Acenaphthene	48	U
86-73-7	Fluorene	48	U
129-00-0	Pyrene	19	U
85-01-8	Phenanthrene	48	U
120-12-7	Anthracene	48	U
206-44-0	Fluoranthene	19	U
218-01-9	Chrysene	9.4	U
205-99-2	Benzo(b)fluoranthene	9.4	U
207-08-9	Benzo(k)fluoranthene	9.4	U
53-70-3	Dibenzo(a,h)anthracene	9.4	U
191-24-2	Benzo(g,h,i)perylene	9.4	U
56-55-3	Benzo(a)anthracene	9.4	U
50-32-8	Benzo(a)pyrene	9.4	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.4	U
208-96-8	Acenaphthylene	48	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-12

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 17 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	160	P
83-32-9	Acenaphthene	160	P
86-73-7	Fluorene	51	U
129-00-0	Pyrene	13	J
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

FORM I PEST

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~DUP-13~~ D_13 RA 2/26/

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-18

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/13/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/25/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	34	PJ-6
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	21	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB41A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R2
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB41B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R1
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB45A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB45B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR1,2
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB47A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R1 R
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB47B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR,L
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB48A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB48B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB50A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB50B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R1 Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB51A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB51B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB51C

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB54A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB54B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R1
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB55A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB55B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR,Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-12

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 12/31/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR,X
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~DUP-13~~ D-13

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810 RA 2/26/03

Matrix: (soil/water) SOIL Lab Sample ID: U2810-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R1
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB41A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-19

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB41B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-20

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB45A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-14

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB45B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-15

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB47A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-16

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB47B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-17

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB48A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB48B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB49C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB50A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB50B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB51A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB51B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB51C

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/06/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB54A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-12

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB54B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-13

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB55A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB55B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-12

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix: (soil/water) SOIL Lab Sample ID: U2810-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/04/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~DUP-13~~ D_13

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810 RA 3/4/03

Matrix: (soil/water) SOIL Lab Sample ID: U2810-18

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/10/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

FORM I PEST

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB41A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-19

Level (low/med): LOW Date Received: 12/11/02

% Solids: 75.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13000			P	
7440-36-0	Antimony	0.49	U	N	P	UL, M
7440-38-2	Arsenic	1.4		N	P	L, M
7440-39-3	Barium	184		*E	P	J, S
7440-41-7	Beryllium	0.88		E	P	J/S
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1610		E	P	J, S
7440-47-3	Chromium	20.7		E	P	
7440-48-4	Cobalt	9.9		E	P	
7440-50-8	Copper	17.0		E	P	
7439-89-6	Iron	19600		E	P	
7439-92-1	Lead	50.8		*E	P	J, K
7439-95-4	Magnesium	1830		E	P	J, S
7439-96-5	Manganese	767		E	P	J, S
7439-97-6	Mercury	0.043	B		CV	
7440-02-0	Nickel	11.0		E	P	J, S
7440-09-7	Potassium	1270		E	P	
7782-49-2	Selenium	1.7		N	P	B, X
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	202	B		P	L, W
7440-28-0	Thallium	0.67	U	N	P	
7440-62-2	Vanadium	36.9		E	P	J, S
7440-66-6	Zinc	71.8		N*E	P	J, K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB41B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-20

Level (low/med): LOW Date Received: 12/11/02

% Solids: 91.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15700			P	
7440-36-0	Antimony	0.40	U	N	P	JL|M
7440-38-2	Arsenic	1.7		N	P	L|M
7440-39-3	Barium	155		*E	P	J|S
7440-41-7	Beryllium	0.77		E	P	↓
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	1270		E	P	J|S
7440-47-3	Chromium	24.1		E	P	
7440-48-4	Cobalt	10.2		E	P	
7440-50-8	Copper	3.9		E	P	
7439-89-6	Iron	24800		E	P	
7439-92-1	Lead	10.6		*E	P	J|K
7439-95-4	Magnesium	4080		E	P	J|S
7439-96-5	Manganese	534		E	P	↓
7439-97-6	Mercury	0.033	B		CV	
7440-02-0	Nickel	12.8		E	P	J|S
7440-09-7	Potassium	2360		E	P	↓
7782-49-2	Selenium	1.6		N	P	B|X
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	197	B		P	L|W
7440-28-0	Thallium	0.56	U	N	P	UL|M
7440-62-2	Vanadium	38.6		E	P	J|S
7440-66-6	Zinc	70.7		N*E	P	J|K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB45A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-14

Level (low/med): LOW Date Received: 12/10/02

% Solids: 87.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12600			P	
7440-36-0	Antimony	0.41	U	N	P	UL,M
7440-38-2	Arsenic	0.44	B	N	P	L,W
7440-39-3	Barium	91.9		*E	P	J,S
7440-41-7	Beryllium	0.61		E	P	↓
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	820		E	P	J,S
7440-47-3	Chromium	19.2		E	P	↓
7440-48-4	Cobalt	7.9		E	P	
7440-50-8	Copper	3.3		E	P	
7439-89-6	Iron	19200		E	P	
7439-92-1	Lead	7.4		*E	P	J,K
7439-95-4	Magnesium	3450		E	P	J,S
7439-96-5	Manganese	370		E	P	↓
7439-97-6	Mercury	0.029	B		CV	
7440-02-0	Nickel	11.2		E	P	J,S
7440-09-7	Potassium	2220		E	P	↓
7782-49-2	Selenium	1.0		N	P	B,X
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	182	B		P	L,W
7440-28-0	Thallium	0.57	U	N	P	UL,M
7440-62-2	Vanadium	33.4		E	P	J,S
7440-66-6	Zinc	54.4		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB45B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-15

Level (low/med): LOW Date Received: 12/10/02

% Solids: 86.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11300			P	
7440-36-0	Antimony	0.42	U	N	P	UL1M
7440-38-2	Arsenic	1.1	B	N	P	L1W
7440-39-3	Barium	74.8		*E	P	J1S
7440-41-7	Beryllium	0.54	B	E	P	↓
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1150		E	P	J1S
7440-47-3	Chromium	16.0		E	P	
7440-48-4	Cobalt	7.4		E	P	
7440-50-8	Copper	7.0		E	P	
7439-89-6	Iron	18500		E	P	↓
7439-92-1	Lead	6.7		*E	P	J1K
7439-95-4	Magnesium	3160		E	P	J1S
7439-96-5	Manganese	321		E	P	↓
7439-97-6	Mercury	0.022	B		CV	
7440-02-0	Nickel	10.0		E	P	J1S
7440-09-7	Potassium	1640		E	P	↓
7782-49-2	Selenium	1.2		N	P	B1X
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	158	B		P	L1W
7440-28-0	Thallium	0.58	U	N	P	UL1W1
7440-62-2	Vanadium	30.8		E	P	J1S
7440-66-6	Zinc	41.0		N*E	P	J1K

Color Before: BROWN Clarity Before: Texture: FINE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB47A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-16

Level (low/med): LOW Date Received: 12/10/02

% Solids: 83.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14500			P	
7440-36-0	Antimony	0.45	U	N	P	ULIM
7440-38-2	Arsenic	0.99	B	N	P	L,W
7440-39-3	Barium	171		*E	P	J,S
7440-41-7	Beryllium	0.92		E	P	↓
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1580		E	P	J,S
7440-47-3	Chromium	22.1		E	P	
7440-48-4	Cobalt	9.2		E	P	
7440-50-8	Copper	15.4		E	P	
7439-89-6	Iron	21000		E	P	↓
7439-92-1	Lead	24.9		*E	P	J,K
7439-95-4	Magnesium	2950		E	P	J,S
7439-96-5	Manganese	658		E	P	↓
7439-97-6	Mercury	0.043			CV	
7440-02-0	Nickel	13.5		E	P	J,S
7440-09-7	Potassium	1520		E	P	↓
7782-49-2	Selenium	1.5		N	P	B,X
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	220	B		P	L,W
7440-28-0	Thallium	0.61	U	N	P	ULIM
7440-62-2	Vanadium	30.6		E	P	J,S
7440-66-6	Zinc	100		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB47B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-17

Level (low/med): LOW Date Received: 12/10/02

% Solids: 91.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6910			P	
7440-36-0	Antimony	0.37	U	N	P	ULIM
7440-38-2	Arsenic	0.25	U	N	P	ULIN
7440-39-3	Barium	60.0		*E	P	J/-
7440-41-7	Beryllium	0.42	B	E	P	↓
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	919		E	P	J/S
7440-47-3	Chromium	11.6		E	P	↓
7440-48-4	Cobalt	4.9		E	P	↓ J/S
7440-50-8	Copper	0.39	B	E	P	B/K
7439-89-6	Iron	11600		E	P	J/S
7439-92-1	Lead	4.5		*E	P	J/K
7439-95-4	Magnesium	1830		E	P	J/S
7439-96-5	Manganese	217		E	P	↓
7439-97-6	Mercury	0.019	B		CV	
7440-02-0	Nickel	7.2		E	P	J/S
7440-09-7	Potassium	997		E	P	↓
7782-49-2	Selenium	0.73		N	P	B/K
7440-22-4	Silver	0.07	U		P	
7440-23-5	Sodium	136	B		P	LW
7440-28-0	Thallium	0.51	U	N	P	ULIM
7440-62-2	Vanadium	18.8		E	P	J/S
7440-66-6	Zinc	31.7		N*E	P	J/K

Color Before: BROWN Clarity Before: Texture: FINE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB48A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-10

Level (low/med): LOW Date Received: 12/10/02

% Solids: 83.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12700			P	
7440-36-0	Antimony	0.41	U	N	P	J,L,M
7440-38-2	Arsenic	0.84	B	N	P	L,W
7440-39-3	Barium	98.4		*E	P	J,S
7440-41-7	Beryllium	0.65		E	P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	1140		E	P	J,S
7440-47-3	Chromium	19.8		E	P	
7440-48-4	Cobalt	7.5		E	P	
7440-50-8	Copper	7.9		E	P	
7439-89-6	Iron	19300		E	P	
7439-92-1	Lead	55.1		*E	P	J,K
7439-95-4	Magnesium	3280		E	P	J,S
7439-96-5	Manganese	369		E	P	
7439-97-6	Mercury	0.10			CV	
7440-02-0	Nickel	11.6		E	P	J,S
7440-09-7	Potassium	2090		E	P	
7782-49-2	Selenium	1.2		N	P	B,K
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	198	B		P	L,W
7440-28-0	Thallium	0.57	U	N	P	J,L,M
7440-62-2	Vanadium	33.8		E	P	J,S
7440-66-6	Zinc	65.9		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB48B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-11

Level (low/med): LOW Date Received: 12/10/02

% Solids: 86.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14300			P	
7440-36-0	Antimony	0.39	U	N	P	UL,M
7440-38-2	Arsenic	0.95	B	N	P	L,W
7440-39-3	Barium	88.4		*E	P	J,S
7440-41-7	Beryllium	0.65		E	P	↓
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	1000		E	P	J,S
7440-47-3	Chromium	18.8		E	P	
7440-48-4	Cobalt	8.6		E	P	
7440-50-8	Copper	15.1		E	P	
7439-89-6	Iron	21100		E	P	↓
7439-92-1	Lead	7.8		*E	P	J,K
7439-95-4	Magnesium	3990		E	P	J,S
7439-96-5	Manganese	364		E	P	↓
7439-97-6	Mercury	0.042			CV	
7440-02-0	Nickel	12.2		E	P	J,S
7440-09-7	Potassium	1790		E	P	↓
7782-49-2	Selenium	1.0		N	P	B,X
7440-22-4	Silver	0.07	U		P	
7440-23-5	Sodium	189	B		P	L,W
7440-28-0	Thallium	0.54	U	N	P	UL,M
7440-62-2	Vanadium	36.1		E	P	J,S
7440-66-6	Zinc	49.6		N*E	P	S,X

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB49C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-1

Level (low/med): LOW Date Received: 12/6/02

% Solids: 80.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10700			P	
7440-36-0	Antimony	0.43	U	N	P	UL,M
7440-38-2	Arsenic	0.71	B	N	P	L,W
7440-39-3	Barium	102		*E	P	J,S
7440-41-7	Beryllium	0.50	B	E	P	J,S
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1440		E	P	J,S
7440-47-3	Chromium	22.5		E	P	↓
7440-48-4	Cobalt	5.7		E	P	↓
7440-50-8	Copper	0.79		E	P	L,W
7439-89-6	Iron	15400		E	P	
7439-92-1	Lead	6.1		*E	P	J,K
7439-95-4	Magnesium	3280		E	P	J,S
7439-96-5	Manganese	159		E	P	↓
7439-97-6	Mercury	0.030	B		CV	
7440-02-0	Nickel	9.3		E	P	J,S
7440-09-7	Potassium	1490		E	P	↓
7782-49-2	Selenium	1.1		N	P	L,M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	169	B		P	L,W
7440-28-0	Thallium	0.59	U	N	P	UL,M
7440-62-2	Vanadium	25.3		E	P	J,S
7440-66-6	Zinc	38.2		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB50A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-8

Level (low/med): LOW Date Received: 12/10/02

% Solids: 79.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	14800			P	
7440-36-0	Antimony	0.45	U	N	P	UL, M
7440-38-2	Arsenic	0.97	B	N	P	L, W
7440-39-3	Barium	155		*E	P	J, S
7440-41-7	Beryllium	0.86		E	P	↓
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1490		E	P	J, S
7440-47-3	Chromium	22.3		E	P	
7440-48-4	Cobalt	11.6		E	P	
7440-50-8	Copper	9.3		E	P	
7439-89-6	Iron	21300		E	P	↓
7439-92-1	Lead	10.5		*E	P	J, K
7439-95-4	Magnesium	3140		E	P	J, S
7439-96-5	Manganese	701		E	P	↓
7439-97-6	Mercury	0.062			CV	
7440-02-0	Nickel	13.6		E	P	J, S
7440-09-7	Potassium	1560		E	P	J =
7782-49-2	Selenium	1.6		N	P	B, X
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	203	B		P	L, W
7440-28-0	Thallium	0.61	U	N	P	UL, M
7440-62-2	Vanadium	32.7		E	P	J, S
7440-66-6	Zinc	66.7		N*E	P	J, K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB50B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-9

Level (low/med): LOW Date Received: 12/10/02

% Solids: 87.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	8920			P	
7440-36-0	Antimony	0.41	U	N	P	DL|M
7440-38-2	Arsenic	0.43	B	N	P	L|N
7440-39-3	Barium	84.4		*E	P	J|S
7440-41-7	Beryllium	0.53	B	E	P	↓
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	1170		E	P	J|S
7440-47-3	Chromium	14.1		E	P	↓
7440-48-4	Cobalt	6.3		E	P	
7440-50-8	Copper	1.8		E	P	
7439-89-6	Iron	14500		E	P	↓
7439-92-1	Lead	5.7		*E	P	J|K
7439-95-4	Magnesium	2350		E	P	J|S
7439-96-5	Manganese	318		E	P	↓
7439-97-6	Mercury	0.041			CV	
7440-02-0	Nickel	8.9		E	P	J|S
7440-09-7	Potassium	1190		E	P	↓
7782-49-2	Selenium	0.93		N	P	B|X
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	173	B		P	L|W
7440-28-0	Thallium	0.57	U	N	P	DL|M
7440-62-2	Vanadium	22.9		E	P	JS
7440-66-6	Zinc	42.4		N*E	P	J|K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB51A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-2

Level (low/med): LOW Date Received: 12/6/02

% Solids: 80.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15000			P	
7440-36-0	Antimony	0.43	U	N	P	ULIM
7440-38-2	Arsenic	0.94	B	N	P	LW
7440-39-3	Barium	241		*E	P	J/S
7440-41-7	Beryllium	1.1		E	P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1410		E	P	J/S
7440-47-3	Chromium	20.0		E	P	
7440-48-4	Cobalt	8.6		E	P	
7440-50-8	Copper	20.6		E	P	
7439-89-6	Iron	17900		E	P	
7439-92-1	Lead	11.8		*E	P	J/K
7439-95-4	Magnesium	2340		E	P	J/S
7439-96-5	Manganese	751		E	P	
7439-97-6	Mercury	0.049			CV	
7440-02-0	Nickel	12.7		E	P	J/S
7440-09-7	Potassium	1770		E	P	J/S
7782-49-2	Selenium	1.8		N	P	LIM
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	196	B		P	LW
7440-28-0	Thallium	0.59	U	N	P	ULIM
7440-62-2	Vanadium	29.7		E	P	J/S
7440-66-6	Zinc	72.8		N*E	P	J/K

Color Before: BROWN Clarity Before: Texture: COARSE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB51B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-3

Level (low/med): LOW Date Received: 12/6/02

% Solids: 85.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15200			P	
7440-36-0	Antimony	0.43	U	N	P	UL1M
7440-38-2	Arsenic	1.7		N	P	L1M
7440-39-3	Barium	123		*E	P	J/S
7440-41-7	Beryllium	0.68		E	P	↓
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1200		E	P	J/S
7440-47-3	Chromium	18.7		E	P	↓
7440-48-4	Cobalt	9.1		E	P	
7440-50-8	Copper	21.0		E	P	
7439-89-6	Iron	23000		E	P	
7439-92-1	Lead	8.4		*E	P	J/C
7439-95-4	Magnesium	4010		E	P	J/S
7439-96-5	Manganese	417		E	P	J/S
7439-97-6	Mercury	0.040			CV	
7440-02-0	Nickel	12.9		E	P	J/S
7440-09-7	Potassium	2250		E	P	J/S
7782-49-2	Selenium	1.2		N	P	L1M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	183	B		P	L1W
7440-28-0	Thallium	0.59	U	N	P	UL1M
7440-62-2	Vanadium	36.2		E	P	J/S
7440-66-6	Zinc	52.2		N*E	P	J/C

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB51C

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-4

Level (low/med): LOW Date Received: 12/6/02

% Solids: 83.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13500			P	
7440-36-0	Antimony	0.42	U	N	P	UL M
7440-38-2	Arsenic	1.2		N	P	L M
7440-39-3	Barium	116		*E	P	J S
7440-41-7	Beryllium	0.62		E	P	↓
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1190		E	P	J S
7440-47-3	Chromium	23.9		E	P	
7440-48-4	Cobalt	8.7		E	P	
7440-50-8	Copper	10.5		E	P	
7439-89-6	Iron	21000		E	P	
7439-92-1	Lead	8.0		*E	P	J K
7439-95-4	Magnesium	3690		E	P	J S
7439-96-5	Manganese	428		E	P	↓
7439-97-6	Mercury	0.044			CV	
7440-02-0	Nickel	12.1		E	P	J S
7440-09-7	Potassium	2100		E	P	↓
7782-49-2	Selenium	1.3		N	P	L M
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	188	B		P	L W
7440-28-0	Thallium	0.58	U	N	P	UL M
7440-62-2	Vanadium	33.5		E	P	J S
7440-66-6	Zinc	49.7		N*E	P	J K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB54A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-12

Level (low/med): LOW Date Received: 12/10/02

% Solids: 82.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9520			P	
7440-36-0	Antimony	0.43	U	N	P	UL,M
7440-38-2	Arsenic	0.63	B	N	P	L,W
7440-39-3	Barium	119		*E	P	J,S
7440-41-7	Beryllium	0.61		E	P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	949		E	P	J,S
7440-47-3	Chromium	15.7		E	P	
7440-48-4	Cobalt	6.5		E	P	
7440-50-8	Copper	4.1		E	P	
7439-89-6	Iron	14300		E	P	
7439-92-1	Lead	29.8		*E	P	J,K
7439-95-4	Magnesium	2210		E	P	J,S
7439-96-5	Manganese	540		E	P	
7439-97-6	Mercury	0.032	B		CV	
7440-02-0	Nickel	9.3		E	P	J,S
7440-09-7	Potassium	1340		E	P	
7782-49-2	Selenium	1.1		N	P	B,K
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	182	B		P	L,W
7440-28-0	Thallium	0.59	U	N	P	UL,M
7440-62-2	Vanadium	23.0		E	P	J,S
7440-66-6	Zinc	66.2		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB54B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-13

Level (low/med): LOW Date Received: 12/10/02

% Solids: 84.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12200			P	
7440-36-0	Antimony	0.43	U	N	P	UL, M
7440-38-2	Arsenic	1.5		N	P	L, M
7440-39-3	Barium	102		*E	P	J, S
7440-41-7	Beryllium	0.60		E	P	↓
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1040		E	P	J, S
7440-47-3	Chromium	17.8		E	P	↓
7440-48-4	Cobalt	8.1		E	P	↓
7440-50-8	Copper	7.8		E	P	↓
7439-89-6	Iron	20200		E	P	↓
7439-92-1	Lead	7.3		*E	P	J, K
7439-95-4	Magnesium	3740		E	P	J, S
7439-96-5	Manganese	362		E	P	↓
7439-97-6	Mercury	0.020	B		CV	
7440-02-0	Nickel	11.0		E	P	J, S
7440-09-7	Potassium	1850		E	P	↓
7782-49-2	Selenium	1.0		N	P	B, K
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	180	B		P	L, W
7440-28-0	Thallium	0.60	U	N	P	UL, M
7440-62-2	Vanadium	32.3		E	P	J, S
7440-66-6	Zinc	46.7		N*E	P	J, K

Color Before: BROWN Clarity Before: Texture: FINE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB55A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-5

Level (low/med): LOW Date Received: 12/10/02

% Solids: 82.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17600			P	
7440-36-0	Antimony	0.45	U	N	P	J,L,M
7440-38-2	Arsenic	0.54	B	N	P	L,W
7440-39-3	Barium	121		*E	P	J,S
7440-41-7	Beryllium	0.65		E	P	↓
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1060		E	P	J,S
7440-47-3	Chromium	22.1		E	P	↓
7440-48-4	Cobalt	6.1		E	P	
7440-50-8	Copper	10.2		E	P	
7439-89-6	Iron	17900		E	P	↓
7439-92-1	Lead	16.5		*E	P	J,K
7439-95-4	Magnesium	2970		E	P	J,S
7439-96-5	Manganese	296		E	P	↓
7439-97-6	Mercury	0.15			CV	
7440-02-0	Nickel	11.1		E	P	J,S
7440-09-7	Potassium	2140		E	P	↓
7782-49-2	Selenium	1.3		N	P	B,K
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	220	B		P	L,W
7440-28-0	Thallium	0.62	U	N	P	J,L,M
7440-62-2	Vanadium	30.3		E	P	J,S
7440-66-6	Zinc	61.9		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
D-12

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-6

Level (low/med): LOW Date Received: 12/10/02

% Solids: 82.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	11200			P	
7440-36-0	Antimony	0.42	U	N	P	UL,M
7440-38-2	Arsenic	0.34	B	N	P	L,W
7440-39-3	Barium	119		*E	P	J,S
7440-41-7	Beryllium	0.66		E	P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1040		E	P	J,S
7440-47-3	Chromium	19.6		E	P	
7440-48-4	Cobalt	6.6		E	P	
7440-50-8	Copper	6.0		E	P	
7439-89-6	Iron	17000		E	P	
7439-92-1	Lead	13.4		*E	P	J,C
7439-95-4	Magnesium	2750		E	P	J,S
7439-96-5	Manganese	380		E	P	
7439-97-6	Mercury	0.057			CV	
7440-02-0	Nickel	10.4		E	P	J,S
7440-09-7	Potassium	1920		E	P	
7782-49-2	Selenium	1.1		N	P	B,Z
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	183	B		P	L,W
7440-28-0	Thallium	0.58	U	N	P	UL,M
7440-62-2	Vanadium	27.2		E	P	J,S
7440-66-6	Zinc	56.7		N*E	P	J,C

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
~~DUP-13~~ D13

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-18

Level (low/med): LOW Date Received: 12/10/02

% Solids: 82.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17000			P	
7440-36-0	Antimony	0.43	U	N	P	UL, M
7440-38-2	Arsenic	1.4		N	P	L, M
7440-39-3	Barium	182		*E	P	J, S
7440-41-7	Beryllium	1.0		E	P	↓
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1780		E	P	J, S
7440-47-3	Chromium	25.3		E	P	
7440-48-4	Cobalt	9.6		E	P	
7440-50-8	Copper	18.4		E	P	
7439-89-6	Iron	24600		E	P	↓
7439-92-1	Lead	36.6		*E	P	J, K
7439-95-4	Magnesium	3260		E	P	J, S
7439-96-5	Manganese	726		E	P	↓
7439-97-6	Mercury	0.042			CV	
7440-02-0	Nickel	15.1		E	P	J, S
7440-09-7	Potassium	1690		E	P	↓
7782-49-2	Selenium	1.6		N	P	B, K
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	262			P	
7440-28-0	Thallium	0.59	U	N	P	UL, M
7440-62-2	Vanadium	36.2		E	P	J, S
7440-66-6	Zinc	127		N*E	P	J, K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB55B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: U2810

Matrix (soil/water): SOIL Lab Sample ID: U2810-7

Level (low/med): LOW Date Received: 12/10/02

% Solids: 88.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12100			P	
7440-36-0	Antimony	0.42	U	N	P	UL,M
7440-38-2	Arsenic	1.3		N	P	UL,M
7440-39-3	Barium	80.4		*E	P	J,S
7440-41-7	Beryllium	0.59		E	P	↓
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	1290		E	P	J,S
7440-47-3	Chromium	18.1		E	P	↓
7440-48-4	Cobalt	8.2		E	P	
7440-50-8	Copper	7.8		E	P	
7439-89-6	Iron	19900		E	P	↓
7439-92-1	Lead	7.3		*E	P	J,K
7439-95-4	Magnesium	3900		E	P	J,S
7439-96-5	Manganese	327		E	P	↓
7439-97-6	Mercury	0.039			CV	
7440-02-0	Nickel	11.7		E	P	J,S
7440-09-7	Potassium	2300		E	P	↓
7782-49-2	Selenium	1.3		N	P	B,X
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	206	B		P	L,N
7440-28-0	Thallium	0.58	U	N	P	UL,M
7440-62-2	Vanadium	31.7		E	P	J,S
7440-66-6	Zinc	49.2		N*E	P	J,K

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 2/4/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: U2810
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

	collected	extracted	analyzed
	12/9/02, 12/10/02	12/13/02	12/19/02
	12/5/02	4	4

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes: EQB-13, -14 in RZ810 ND✓

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes: See attached atrazine NDs → RIC in all

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			✓
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓
	1 or more <10% / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high			
	Positives: L / J / L / K			
	Non-detects: R / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: atrazine MS 130% & 150% prev. flagged ✓

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: D-12 , 545855A all ND all ND

D-13 , 545847B all ND all ND

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".	✓		

Notes:

pos TIC → NJ, t

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 20			
12.1.2	Number of target compounds in each analysis: 65			
12.1.3	Number of results rejected and not reported: 20			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 95% ✓			

Notes:

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 3/3/03
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: U2810
Test Name: PEST
Method No.: 8081A

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	✓		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes: collect 12/9/02 extract 12/13/02 analyzed 12/16/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	✓		

3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	✓		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	✓		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	✓		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		

Notes:

ICC attached

Pos J,C.

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Resolution Check Mixture been analyzed at the beginning of every initial calibration sequence, on each GC column and intrument used for analysis?	✓		✓
5.2	Is the resulution between all adjacent peaks in the Resolution Check Mixture greater than or equal to 60% for both column?	✓		✓

	Detected target compounds that were not adequately resolved should be qualified with "J". Qualitative identifications may also be questionable if coelution exists. Non-detects with retention times in the region of coelution may not be valid, depending on the extent of the problem. Professional judgement should be used to			✓
5.3	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning (following the RCM) and the end of every initial calibration sequence, on each GC column and intrument used for analysis? The PEM must also analyzed at the beginning of every other 12-hour analytical period.			✓
5.4	Is the resulution between all adjacent peaks in the PEM equal to 100% in each calibration (initial and continuing) for both column?			✓
5.4	Do all standard retention times of each of the single component pesticides and surrogate in all PEM fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.			✓
5.5	Are all PEM %Ds less than or equal to 25%? If No, J(+)/UJ(-).			✓
5.6	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	✓		
5.7	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	✓		
5.8	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	✓		

Notes:

6.0 Surrogate Recovery					**Yes**	**No**	**NA**
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?				✓		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.				✓		
6.3	Are surrogate recoveries within acceptance criteria for all samples and method blanks?				✓		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?						✓
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)						✓
	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance			
	1 out	high/low	No action	No action			
	2 out	2 high same column	K	No action			

		2 low same column	L, UL	No action
		mixed same column	J, UJ	No action
		2 high diff columns	J	Not applicable
		2 low diff columns	J, UJ	Not applicable
		mixed diff columns	Professional judgement	Not applicable
	3 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		2 high, 1 low	K (2 high)	J (1 low 2nd column)
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
		other mixed	J, UJ	Not applicable
	4 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		Mixed	J, UJ	Not applicable
	If any recovery is >0% and <10% then L(+)/R(-).			
	If any recovery is 0% then R(+/-).			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: see attached
all ND in parent 524SB553B no flag

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: 414-DDD 240
Endosulfan II 160 } QC. ALL ND, no flags

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: D-12 5458SSA % RPD
heptachlor epoxide 4.8 5.9 21%

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		✓	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes: Several >40% → J/q unless prev.

11.0 Pesticide Cleanup Checks (Required when any positive result is reported > 38 ug/Kg for soils)		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
12.1.4	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100 %.			

Notes:

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RA
Date: 2/26/03
DV Level: II (III) IV
Review Document:

_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: U2810
Test Name: PAH
Method No.: 8310-HPLC

UJ's 12

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

collect	extract	analyzed
12/9/02, 12/10/02	12/13/02	12/25/02, 12/26/02
12/5/02	4	12/24/02, 12/25/02

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes:

EB in R2510 all ND

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	✓		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			✓
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			✓
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			/
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			/
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			/

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓	✓	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: Acenaphthene %RPD 22%7 QC pos J,d in parent 54SB41A

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		✓	

Notes: 54SB47B and D-13

Pyrene	760	RL=51	34	OKV

54SB55A RL D-12

Naphthalene	410	51	160	250 / 2x51
Benzo(b)fluoranthene	5		10 U	OK
Acenaphthene	510		160	
Pyrene	20 J		13	OKV

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

Several >40% -> J/g

10.0 Data Completeness		**Yes**	**No**	**NA**
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			
	% Completeness = 100			

Notes:

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 2/24/03
DV Level: II (III) IV

Review Document:

_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: V2810
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes: collected 12/9/02, 12/10/02 extracted 12/17/02 analyzed 1/1/03 - 1/31/03

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes: EQB-13, EQB-14 in K2510 ND ✓

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: No pos. for Pos. bias
neg bias acceptable on the other column, no flags

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 1315-TNB 8/0, all rev >RL)

RPD>QC 4-amino — no pos, no flag

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes: 1315-TNB 43%<QC all ND >RL

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 545B47B all ND, D-13 all ND | 545B55A all ND, D-12 all ND

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		✓	

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: 20			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness = 93%			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: AJ
Date: 25Jan03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: U2810
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?		X	
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?			X
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: COC 1039 - not signed by lab.
COC 1040 - not signed by lab.

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: cooler temps 2.0°C, 2.2°C, 2.0°C

sampled 12/4, 12/9, 12/10
extracted 12/17
analysis 01/04, 01/06

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			X

Notes: NO equipment / field blanks submitted in this batch

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).	X		
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? 50-150%	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS %R - 110% MSD %R - 100% % RPD - 10%

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: LCS %R 100%

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.	X		

Notes: 2 field dups in this batch

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: U2810
Project No.: 15291524.00000

Project Name: Radford SWMU 54
Reviewer: RA
Date: 2/26/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{o}C \pm 2\ ^{o}C$)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes, % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: collected analyzed
12/5/02 12/10/02 12/16/02 Hg
6 12/15/02 ICP

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%? <50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K		✓				

Note:

Al 114.2 all 2xCRDL no flag
antimony 112.7 all ND J J
Arsenic 79.8 UL, LW
Copper 69.4 LW
lead 71.3 all 2xCRDL no flag
nickel 130.4 J J
Sodium 75.4 LW

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L		✓				
4.5	Are there reported field blankor trip blank values > ± MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						

EQB_12
CV .67 4/9/12
75x, 110
FIGS

EQB_14
copper
1.6
<5X →
B, X

Note: 23 MB → Ca .047
5.66 Ca 1.133
33.9 Mg 6.796
1.48 Zn .216
all 75X
no FIGS

ICB, CCB pos Ba, Be, Ca, Mg, neg. Ns
all 75x, no action

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	

Action:	Solid		Aqueous		
	< LCL	> UCL	< 50%	50% - 79%	> 120%
	L(+)/UL(-)	K(+)	L(+)/R(-)	L(+)/UL(-)	K(+)

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.		✓		✓		

Note: lead 129 % } POS J, K
zinc 39.8 %

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓		
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L						
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	✓					✓

Note: antimony 32/34.8 ULim thallium 63.6 ULim
arsenic 74.5 LLim zinc 63.6/68.9 Prev Flagged for lab dup. no more
Se 73.1 LLim

9.0 Instrument Detection Limits (IDL) unless prev.

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note: See attached
JFS unless prev.

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		✓			✓	

Note: D-12, 545B55A
Al, Copper, Hg 2QC

D-13, 545B47B
all except Ca, Se outside QC
comment -

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓		
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note: _____

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples: _____						
13.1.2	Number of target compounds in each analysis: _____						
13.1.3	Number of results rejected and not reported: _____						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100						

Note: _____

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: _____V2810_____ **Fraction:** _SVOCs, PAH, Explosives,Nitroglycerin, Metals

Lab: _CompuChem_____ **Project Name:** __Radford SWMU 54_____

Reviewer: _____RA, AJ_____ **Date:** _____March 7, 2003_____

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the SVOC analyses, the initial calibration analyzed on 12/17/02 displayed a %RSD greater than the control limit (i.e., 15%) for atrazine at 86.09%. All associated sample results were non-detect and were flagged "R,r". The continuing calibration analyzed on 12/22/02 displayed a %D greater than the QC limit (i.e., 20%) with a negative bias for atrazine at 82.8%. All associated sample results were non-detects and were flagged "R,c."

For the explosive analyses, the LCS recoveries for 1,3,5-trinitrobenzene (0%) and nitrobenzene (47%) were less than the lower QC limit (i.e., 50%). All associated sample results were non-detects and were flagged "R,l." The percent completeness was less than the QC limit (i.e., 90%) at 86% due to this anomaly.

For the metals analyses, the MS/MSD recoveries for thallium (0%/0%) were less than the lower QC limit (i.e., 75%). All associated sample results were non-detects and were flagged "R,m."

Minor Anomalies: For the SVOC analyses, the CCV analyzed on 12/22/02 at 1129 displayed %Ds greater than the control limit (i.e., 20%) with a positive bias for hexachlorocyclopentadiene at 44.42%, 2,4-dinitrophenol at 31.56%, 4,6-dinitro-2-methylphenol at 25.44%, indeno(1,2,3-cd)pyrene at 22.3%, and benzo(g,h,i)perylene at 22.8%. All associated sample results were non-detect and no data qualifying action was required. The CCV analyzed on 12/26/02 at 1110 displayed a %D greater than the control limit with a negative bias for atrazine at 45.64%. All associated sample results were previously flagged due to initial calibration failure and no further data qualifying action was required.

The recoveries for all surrogates except 2,4,6-tribromophenol were less than the lower QC limits in sample D-14. Positive results were flagged "L,s" and non-

detects were flagged "UL,s", unless previously flagged due to other anomalies. This sample was re-extracted and re-analyzed with similar results. The original sample results should be used for data interpretations.

The RPD for the MS/MSD analysis was greater than the QC limit for diethylphthalate at 50%. The associated sample result was a non-detect in the parent sample 54SB52A and no data qualifying action was required.

The LCS recoveries for atrazine (164%/154%) were greater than the upper QC limit. No positive results were reported for these compounds and no data qualifying action was required.

The 2,6-dinitrotoluene (183%), 2,4-dinitrotoluene (194%), diethylphthalate (84%), n-nitrosodiphenylamine (147%), di-n-butylphthalate (176%), and bis(2-ethylhexyl)phthalate(64%) results were outside the QC limit for the field duplicate pair D-14/54SB42A. No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

For the PAH analyses, the CCV analyzed on 12/30/02 at 0152 displayed a %D greater than the QC limit (i.e., 15%) with a negative bias for benzo(k)fluoranthene at 15.89%. Positive results were flagged "J,c" in the associated samples. No data flags were applied to the non-detect results since the %D was acceptable on the other column.

The LCS recoveries for naphthalene (25%), acenaphthene (18%), and fluorene (48%) were less than the lower QC limit (i.e., 50%). Positive results were flagged "J,l" in the associated samples, unless previously flagged for high RPD between the two column concentrations.

The RPD (62%) and MS/MSD (47%/25%) recoveries for naphthalene and the RPD for acenaphthylene (22%) were outside the QC limit for the matrix spike pair analyzed on sample 54SB52A. Naphthalene was flagged "UJ,m" in the parent sample 54SB52A. No positive results were reported for acenaphthylene in the parent sample 54SB52A and no data flags were applied.

The RPDs between the two columns were greater than the QC limit (i.e., 40%) for some compounds in several samples. These results were flagged "J,g" unless previously flagged due to other anomalies.

The absolute value of naphthalene and benzo(b)fluoranthene results were greater than 4 times the RL for the field duplicate pair D-14/54SB42A. No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

For the explosives analyses, the continuing calibration analyzed on 1/1/03 at 0410 displayed %Ds greater than the QC limit (i.e., 15%) with a positive bias for 2,4,6-

trinitrotoluene at 29.58% and 2,4-dinitrotoluene at 25.22% on the first column. The continuing calibration analyzed on 1/1/03 at 1241 displayed a %D greater than the QC limit with a positive bias for 2,4-dinitrotoluene at 28.12% on the first column. The continuing calibrations analyzed on 1/3/03 at 1345 and 2149 displayed %Ds greater than the QC limit with a positive bias for 2,4-dinitrotoluene at 18.23% and 16.35%, respectively on the first column. Positive results were flagged "J,c" in the associated samples. The continuing calibration analyzed on 1/7/03 at 1333 displayed a %D greater than the QC limit with a negative bias for 3-nitrotoluene at 23.68% on the second column. The continuing calibration analyzed on 1/7/03 at 2356 displayed %Ds greater than the QC limit with a negative bias for tetryl at 28.94% and 3-nitrotoluene at 22.8% on the second column. No data qualifying action was required since the associated sample results were non-detect and the %Ds were acceptable on one of the two columns.

The MS recoveries for 1,3,5-trinitrobenzene (13%) and 2,4,6-trinitrotoluene (19%) were less than the lower QC limit. These results were previously flagged in the parent sample D-14 and no further data qualifying action was required. The RPDs for HMX (34%), 1,3,5-trinitrobenzene (124%), and 2,4,6-trinitrotoluene (54%) were greater than the QC limit. No positive results were reported in the parent sample D-14 and no data qualifying action was required.

For the nitroglycerin analyses, the MS/MSD recoveries (-1170%/-1180%) were less than the lower QC limit. No data qualifying action was required since the sample concentration was greater than 4 times the spiking amount.

The absolute value of nitroglycerin result was greater than 4 times the RL for the field duplicate pair D-14/54SB42A. No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

For the metal analyses, the method blank displayed detections greater than the MDL for antimony at 0.121 mg/Kg, calcium at –5.946 mg/Kg, and zinc at –0.284 mg/Kg. Positive antimony results less than 5 times the blank concentration were flagged "B,p" in the associated samples. All associated sample results were positive and were greater than 5 times the blank concentration for calcium and zinc, thus, no data qualifying action was required.

Equipment blank EQB-14 located in SDG R2810 contained copper at 1.6 ug/L and selenium at 3.7 ug/L. Positive results less than 5 times the blank concentration were flagged "B,x" in the associated samples.

The initial and continuing calibration blanks also contained negative results for antimony, arsenic, calcium, iron, sodium and zinc and positive results for magnesium, selenium and potassium. All associated sample results were positive and were either greater than 5 times the blank concentration or were previously

flagged due to method blank contamination. No further data qualifying action was required.

The initial CRDL percent recoveries for aluminum (128.1%), iron (110.9%), lead (83.7%), potassium (69.1%), selenium (123.4%), sodium (118%), thallium (86.2%), and zinc (68.1%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "K,w" for sodium in the associated samples. All associated sample results were greater than 2xCRDL for the other analytes or were previously flagged and no further data qualifying action was required.

The MS/MSD pair for sample 54SB52A displayed recoveries for antimony (35.8%/38.1%) which were less than the lower QC limit. All associated sample results were positive and were flagged "L,m", unless previously flagged due to other anomalies.

The %Ds for serial dilution analyses were greater than the QC limit (i.e., 10%) for nickel (10.4%) and potassium (15.1%). Positive results were flagged "J,s", unless previously flagged due to other anomalies.

The RPD for lead was greater than the QC limit (i.e., 35%) at 41% for the field duplicate pair D-14/54SB42A. No data qualifying action is required based on field duplicate anomalies and no data flags were applied.

Correctable Anomalies: Several compounds were incorrectly flagged "B by the laboratory for the PAH analyses. These flags were removed by the reviewer.

Comments: Due to the abundance of target compounds, most of the samples were analyzed at dilutions for all organic analyses and some inorganic analyses. Therefore, the reporting limits were elevated. The chain of custodies were not signed by the laboratory. No data qualifying action was taken.

Positive TIC results were flagged "NJ,t" in the associated samples. Except for data flagged "R", all data, as qualified, are usable for their intended purpose based on the data reviewed.

Signed: Rangan

SAMPLENUM	CLIENTID	QUOTENUMREF	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
V2810-3	54SB39A	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02
V2810-4	54SB39B	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02
V2810-5	54SB40A	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02
V2810-6	54SB40B	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02
V2810-7	54SB42A	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02
V2810-9	54SB42B	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02
V2810-1	54SB52A	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02
V2810-2	54SB52B	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02
V2810-10	54SB53A	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02
V2810-11	54SB53B	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02
V2810-8	D 14	Q2810	V2810	SO	URS	RADFORD SWMU 54	12/11/02

DUPS

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB39A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-3A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	400	U
108-95-2	Phenol	400	U
111-44-4	Bis(2-chloroethyl)ether	400	U
95-57-8	2-Chlorophenol	400	U
95-48-7	2-Methylphenol	400	U
108-60-1	2,2'-oxybis(1-Chloropropane)	400	U
98-86-2	Acetophenone	400	U
106-44-5	4-Methylphenol	400	U
621-64-7	N-Nitroso-di-N-propylamine	400	U
67-72-1	Hexachloroethane	400	U
98-95-3	Nitrobenzene	400	U
78-59-1	Isophorone	400	U
88-75-5	2-Nitrophenol	400	U
105-67-9	2,4-Dimethylphenol	400	U
111-91-1	Bis(2-chloroethoxy)methane	400	U
120-83-2	2,4-Dichlorophenol	400	U
91-20-3	Naphthalene	400	U
106-47-8	4-Chloroaniline	400	U
87-68-3	Hexachlorobutadiene	400	U
105-60-2	Caprolactam	400	U
59-50-7	4-Chloro-3-methylphenol	400	U
91-57-6	2-Methylnaphthalene	400	U
77-47-4	Hexachlorocyclopentadiene	400	U
88-06-2	2,4,6-Trichlorophenol	400	U
95-95-4	2,4,5-Trichlorophenol	400	U
92-52-4	1,1'-Biphenyl	400	U
91-58-7	2-Chloronaphthalene	400	U
88-74-4	2-Nitroaniline	800	U
131-11-3	Dimethylphthalate	400	U
606-20-2	2,6-Dinitrotoluene	400	U
208-96-8	Acenaphthylene	400	U
99-09-2	3-Nitroaniline	800	U
83-32-9	Acenaphthene	400	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB39A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-3A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 18 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	800	U
121-14-2	2,4-Dinitrotoluene	400	U
132-64-9	Dibenzofuran	400	U
84-66-2	Diethylphthalate	400	U
7005-72-3	4-Chlorophenyl-phenylether	400	U
86-73-7	Fluorene	400	U
100-01-6	4-Nitroaniline	800	U
534-52-1	4,6-Dinitro-2-methylphenol	800	U
86-30-6	N-Nitrosodiphenylamine (1)	400	U
101-55-3	4-Bromophenyl-phenylether	400	U
118-74-1	Hexachlorobenzene	400	U
1912-24-9	Atrazine	400	U R,C
87-86-5	Pentachlorophenol	400	U
85-01-8	Phenanthrene	400	U
120-12-7	Anthracene	400	U
86-74-8	Carbazole	400	U
84-74-2	Di-n-butylphthalate	400	U
206-44-0	Fluoranthene	400	U
129-00-0	Pyrene	400	U
85-68-7	Butylbenzylphthalate	400	U
91-94-1	3,3'-Dichlorobenzidine	400	U
117-81-7	bis(2-ethylhexyl)Phthalate	400	U
56-55-3	Benzo(a)anthracene	400	U
218-01-9	Chrysene	400	U
117-84-0	Di-n-octylphthalate	400	U
205-99-2	Benzo(b)fluoranthene	400	U
207-08-9	Benzo(k)fluoranthene	400	U
50-32-8	Benzo(a)pyrene	400	U
193-39-5	Indeno(1,2,3-cd)pyrene	400	U
53-70-3	Dibenzo(a,h)anthracene	400	U
191-24-2	Benzo(g,h,i)perylene	400	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB39A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-3A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 18 decanted: (Y/N) N Date Extracted: 12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.70~~	~~580~~	~~JB~~
2.		~~UNKNOWN (BC)~~	~~6.95~~	~~260~~	~~JB~~
3.					
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB39B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-4A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 6 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	350	U
108-95-2	Phenol	350	U
111-44-4	Bis(2-chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
98-86-2	Acetophenone	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-N-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
111-91-1	Bis(2-chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
105-60-2	Caprolactam	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	350	U
92-52-4	1,1'-Biphenyl	350	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	700	U
131-11-3	Dimethylphthalate	350	U
606-20-2	2,6-Dinitrotoluene	350	U
208-96-8	Acenaphthylene	350	U
99-09-2	3-Nitroaniline	700	U
83-32-9	Acenaphthene	350	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB39B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-4A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 6 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1800	U
100-02-7	4-Nitrophenol	700	U
121-14-2	2,4-Dinitrotoluene	350	U
132-64-9	Dibenzofuran	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	700	U
534-52-1	4,6-Dinitro-2-methylphenol	700	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
1912-24-9	Atrazine	350	U RC
87-86-5	Pentachlorophenol	350	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U
117-81-7	bis(2-ethylhexyl)Phthalate	350	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-84-0	Di-n-octylphthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenzo(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB39B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-4A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 6 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC) 2,3,5(1)-	5.70	420	JB
2.					
3.					
4.					
5.					
6.					
7.					
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30.					

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB40A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-5A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	410	U
108-95-2	Phenol	410	U
111-44-4	Bis(2-chloroethyl)ether	410	U
95-57-8	2-Chlorophenol	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
98-86-2	Acetophenone	410	U
106-44-5	4-Methylphenol	410	U
621-64-7	N-Nitroso-di-N-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
111-91-1	Bis(2-chloroethoxy)methane	410	U
120-83-2	2,4-Dichlorophenol	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	U
87-68-3	Hexachlorobutadiene	410	U
105-60-2	Caprolactam	410	U
59-50-7	4-Chloro-3-methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	410	U
92-52-4	1,1'-Biphenyl	410	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	810	U
131-11-3	Dimethylphthalate	410	U
606-20-2	2,6-Dinitrotoluene	410	U
208-96-8	Acenaphthylene	410	U
99-09-2	3-Nitroaniline	810	U
83-32-9	Acenaphthene	410	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB40A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-5A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 19 decanted: (Y/N) N Date Extracted: 12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	810	U
121-14-2	2,4-Dinitrotoluene	410	U
132-64-9	Dibenzofuran	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	810	U
534-52-1	4,6-Dinitro-2-methylphenol	810	U
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
1912-24-9	Atrazine	410	U R,C
87-86-5	Pentachlorophenol	410	U
85-01-8	Phenanthrene	410	U
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	410	U
206-44-0	Fluoranthene	410	U
129-00-0	Pyrene	410	U
85-68-7	Butylbenzylphthalate	410	U
91-94-1	3,3'-Dichlorobenzidine	410	U
117-81-7	bis(2-ethylhexyl)Phthalate	180	J
56-55-3	Benzo(a)anthracene	410	U
218-01-9	Chrysene	410	U
117-84-0	Di-n-octylphthalate	410	U
205-99-2	Benzo(b)fluoranthene	410	U
207-08-9	Benzo(k)fluoranthene	410	U
50-32-8	Benzo(a)pyrene	410	U
193-39-5	Indeno(1,2,3-cd)pyrene	410	U
53-70-3	Dibenzo(a,h)anthracene	410	U
191-24-2	Benzo(g,h,i)perylene	410	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB40A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-5A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 19 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.69	370	JB
2.		UNKNOWN (BC)	6.95	220	JB
3.					
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB40B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-6A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	750	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	750	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB40B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-6A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	750	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	750	U
534-52-1	4,6-Dinitro-2-methylphenol	750	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	U RIC
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	380	U
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB40B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-6A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.70	390	JB
2.		UNKNOWN (BC)	6.96	200	JB
3.					
4.					
5.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB42A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-7RDA64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/26/02

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	1600	U
108-95-2	Phenol	1600	U
111-44-4	Bis(2-chloroethyl)ether	1600	U
95-57-8	2-Chlorophenol	1600	U
95-48-7	2-Methylphenol	1600	U
108-60-1	2,2'-oxybis(1-Chloropropane)	1600	U
98-86-2	Acetophenone	1600	U
106-44-5	4-Methylphenol	1600	U
621-64-7	N-Nitroso-di-N-propylamine	1600	U
67-72-1	Hexachloroethane	1600	U
98-95-3	Nitrobenzene	1600	U
78-59-1	Isophorone	1600	U
88-75-5	2-Nitrophenol	1600	U
105-67-9	2,4-Dimethylphenol	1600	U
111-91-1	Bis(2-chloroethoxy)methane	1600	U
120-83-2	2,4-Dichlorophenol	1600	U
91-20-3	Naphthalene	1600	U
106-47-8	4-Chloroaniline	1600	U
87-68-3	Hexachlorobutadiene	1600	U
105-60-2	Caprolactam	1600	U
59-50-7	4-Chloro-3-methylphenol	1600	U
91-57-6	2-Methylnaphthalene	1600	U
77-47-4	Hexachlorocyclopentadiene	1600	U
88-06-2	2,4,6-Trichlorophenol	1600	U
95-95-4	2,4,5-Trichlorophenol	1600	U
92-52-4	1,1'-Biphenyl	1600	U
91-58-7	2-Chloronaphthalene	1600	U
88-74-4	2-Nitroaniline	3100	U
131-11-3	Dimethylphthalate	1600	U
606-20-2	2,6-Dinitrotoluene	830	J
208-96-8	Acenaphthylene	1600	U
99-09-2	3-Nitroaniline	3100	U
83-32-9	Acenaphthene	1600	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB42A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-7RDA64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/26/02

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	7900	U
100-02-7	4-Nitrophenol	3100	U
121-14-2	2,4-Dinitrotoluene	12000	
132-64-9	Dibenzofuran	1600	U
84-66-2	Diethylphthalate	4900	
7005-72-3	4-Chlorophenyl-phenylether	1600	U
86-73-7	Fluorene	1600	U
100-01-6	4-Nitroaniline	3100	U
534-52-1	4,6-Dinitro-2-methylphenol	3100	U
86-30-6	N-Nitrosodiphenylamine (1)	1400	J
101-55-3	4-Bromophenyl-phenylether	1600	U
118-74-1	Hexachlorobenzene	1600	U
1912-24-9	Atrazine	1600	U R,r
87-86-5	Pentachlorophenol	1600	U
85-01-8	Phenanthrene	1600	U
120-12-7	Anthracene	1600	U
86-74-8	Carbazole	1600	U
84-74-2	Di-n-butylphthalate	12000	
206-44-0	Fluoranthene	1600	U
129-00-0	Pyrene	1600	U
85-68-7	Butylbenzylphthalate	1600	U
91-94-1	3,3'-Dichlorobenzidine	1600	U
117-81-7	bis(2-ethylhexyl)Phthalate	490	J
56-55-3	Benzo(a)anthracene	1600	U
218-01-9	Chrysene	1600	U
117-84-0	Di-n-octylphthalate	1600	U
205-99-2	Benzo(b)fluoranthene	1600	U
207-08-9	Benzo(k)fluoranthene	1600	U
50-32-8	Benzo(a)pyrene	1600	U
193-39-5	Indeno(1,2,3-cd)pyrene	1600	U
53-70-3	Dibenzo(a,h)anthracene	1600	U
191-24-2	Benzo(g,h,i)perylene	1600	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB42A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-7RDA64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/26/02

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.58	2100	JB
2.		UNKNOWN	13.02	1300	J
3.					
4.					
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB42B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-9A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	84	J
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB42B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-9A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	33	J
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	100	J
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	29	J
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U R,C
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	120	J
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	68	J
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB42B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-9A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.74	260	JB
2.		UNKNOWN (BC)	6.95	310	JB
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB52A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-1A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	420	U
108-95-2	Phenol	420	U
111-44-4	Bis(2-chloroethyl)ether	420	U
95-57-8	2-Chlorophenol	420	U
95-48-7	2-Methylphenol	420	U
108-60-1	2,2'-oxybis(1-Chloropropane)	420	U
98-86-2	Acetophenone	420	U
106-44-5	4-Methylphenol	420	U
621-64-7	N-Nitroso-di-N-propylamine	420	U
67-72-1	Hexachloroethane	420	U
98-95-3	Nitrobenzene	420	U
78-59-1	Isophorone	420	U
88-75-5	2-Nitrophenol	420	U
105-67-9	2,4-Dimethylphenol	420	U
111-91-1	Bis(2-chloroethoxy)methane	420	U
120-83-2	2,4-Dichlorophenol	420	U
91-20-3	Naphthalene	420	U
106-47-8	4-Chloroaniline	420	U
87-68-3	Hexachlorobutadiene	420	U
105-60-2	Caprolactam	420	U
59-50-7	4-Chloro-3-methylphenol	420	U
91-57-6	2-Methylnaphthalene	420	U
77-47-4	Hexachlorocyclopentadiene	420	U
88-06-2	2,4,6-Trichlorophenol	420	U
95-95-4	2,4,5-Trichlorophenol	420	U
92-52-4	1,1'-Biphenyl	420	U
91-58-7	2-Chloronaphthalene	420	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	420	U
606-20-2	2,6-Dinitrotoluene	420	U
208-96-8	Acenaphthylene	420	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	420	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB52A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-1A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2100	U
100-02-7	4-Nitrophenol	840	U
121-14-2	2,4-Dinitrotoluene	420	U
132-64-9	Dibenzofuran	420	U
84-66-2	Diethylphthalate	420	U
7005-72-3	4-Chlorophenyl-phenylether	420	U
86-73-7	Fluorene	420	U
100-01-6	4-Nitroaniline	840	U
534-52-1	4,6-Dinitro-2-methylphenol	840	U
86-30-6	N-Nitrosodiphenylamine (1)	420	U
101-55-3	4-Bromophenyl-phenylether	420	U
118-74-1	Hexachlorobenzene	420	U
1912-24-9	Atrazine	420	U K/C
87-86-5	Pentachlorophenol	420	U
85-01-8	Phenanthrene	420	U
120-12-7	Anthracene	420	U
86-74-8	Carbazole	420	U
84-74-2	Di-n-butylphthalate	420	U
206-44-0	Fluoranthene	420	U
129-00-0	Pyrene	420	U
85-68-7	Butylbenzylphthalate	420	U
91-94-1	3,3'-Dichlorobenzidine	420	U
117-81-7	bis(2-ethylhexyl)Phthalate	420	U
56-55-3	Benzo(a)anthracene	420	U
218-01-9	Chrysene	420	U
117-84-0	Di-n-octylphthalate	420	U
205-99-2	Benzo(b)fluoranthene	420	U
207-08-9	Benzo(k)fluoranthene	420	U
50-32-8	Benzo(a)pyrene	420	U
193-39-5	Indeno(1,2,3-cd)pyrene	420	U
53-70-3	Dibenzo(a,h)anthracene	420	U
191-24-2	Benzo(g,h,i)perylene	420	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB52A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-1A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 21 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.70	600	JB
2.		UNKNOWN (BC)	6.94	320	JB
3.		UNKNOWN	29.39	220	J
4.		UNKNOWN	31.32	600	J
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB52B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-2A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	380	U
108-95-2	Phenol	380	U
111-44-4	Bis(2-chloroethyl)ether	380	U
95-57-8	2-Chlorophenol	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
98-86-2	Acetophenone	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-N-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
111-91-1	Bis(2-chloroethoxy)methane	380	U
120-83-2	2,4-Dichlorophenol	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
87-68-3	Hexachlorobutadiene	380	U
105-60-2	Caprolactam	380	U
59-50-7	4-Chloro-3-methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	380	U
92-52-4	1,1'-Biphenyl	380	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	750	U
131-11-3	Dimethylphthalate	380	U
606-20-2	2,6-Dinitrotoluene	380	U
208-96-8	Acenaphthylene	380	U
99-09-2	3-Nitroaniline	750	U
83-32-9	Acenaphthene	380	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB52B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-2A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	1900	U
100-02-7	4-Nitrophenol	750	U
121-14-2	2,4-Dinitrotoluene	380	U
132-64-9	Dibenzofuran	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	750	U
534-52-1	4,6-Dinitro-2-methylphenol	750	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
1912-24-9	Atrazine	380	UR,C
87-86-5	Pentachlorophenol	380	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	U
117-81-7	bis(2-ethylhexyl)Phthalate	46	J
56-55-3	Benzo(a)anthracene	380	U
218-01-9	Chrysene	380	U
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	U
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB52B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-2A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 12 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.71	510	JB
2.		UNKNOWN (BC)	6.96	220	JB
3.		2128103			
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB53A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-10A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB53A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-10A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	1500	
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U R1C
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	60	J
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	320	J
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB53A

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-10A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.71~~	~~390~~	~~JB~~
2.		~~UNKNOWN (BC)~~	6.98	190	JB
3.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	19.70	390	NJ
4.		~~UNKNOWN~~	~~28.59~~	~~180~~	~~J~~
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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB53B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-11A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	780	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	390	U
208-96-8	Acenaphthylene	390	U
99-09-2	3-Nitroaniline	780	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

54SB53B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-11A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	780	U
121-14-2	2,4-Dinitrotoluene	390	U
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	120	J
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	780	U
534-52-1	4,6-Dinitro-2-methylphenol	780	U
86-30-6	N-Nitrosodiphenylamine (1)	390	U
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	UR/C
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	390	U
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	40	J
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

54SB53B

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-11A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 15 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	5.70	380	JB
2.					
3.					
4.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-14

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-8A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	390	U UL,S
108-95-2	Phenol	390	U
111-44-4	Bis(2-chloroethyl)ether	390	U
95-57-8	2-Chlorophenol	390	U
95-48-7	2-Methylphenol	390	U
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U
98-86-2	Acetophenone	390	U
106-44-5	4-Methylphenol	390	U
621-64-7	N-Nitroso-di-N-propylamine	390	U
67-72-1	Hexachloroethane	390	U
98-95-3	Nitrobenzene	390	U
78-59-1	Isophorone	390	U
88-75-5	2-Nitrophenol	390	U
105-67-9	2,4-Dimethylphenol	390	U
111-91-1	Bis(2-chloroethoxy)methane	390	U
120-83-2	2,4-Dichlorophenol	390	U
91-20-3	Naphthalene	390	U
106-47-8	4-Chloroaniline	390	U
87-68-3	Hexachlorobutadiene	390	U
105-60-2	Caprolactam	390	U
59-50-7	4-Chloro-3-methylphenol	390	U
91-57-6	2-Methylnaphthalene	390	U
77-47-4	Hexachlorocyclopentadiene	390	U
88-06-2	2,4,6-Trichlorophenol	390	U
95-95-4	2,4,5-Trichlorophenol	390	U
92-52-4	1,1'-Biphenyl	390	U
91-58-7	2-Chloronaphthalene	390	U
88-74-4	2-Nitroaniline	790	U
131-11-3	Dimethylphthalate	390	U
606-20-2	2,6-Dinitrotoluene	37	J L,S
208-96-8	Acenaphthylene	390	U UL,S
99-09-2	3-Nitroaniline	790	U
83-32-9	Acenaphthene	390	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-14

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-8A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	170	J
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	2000	
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	210	J
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	390	U
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	750	
206-44-0	Fluoranthene	390	U
129-00-0	Pyrene	390	U
85-68-7	Butylbenzylphtnalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	250	J
56-55-3	Benzo(a)anthracene	390	U
218-01-9	Chrysene	390	U
117-84-0	Di-n-octylphthalate	390	U
205-99-2	Benzo(b)fluoranthene	390	U
207-08-9	Benzo(k)fluoranthene	390	U
50-32-8	Benzo(a)pyrene	390	U
193-39-5	Indeno(1,2,3-cd)pyrene	390	U
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	390	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-14

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-8A60

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/16/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/22/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN~~	18.90	~~690~~	~~J~~
2.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	19.71	430	NJ
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-14RE

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-8RA64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
100-52-7	Benzaldehyde	390	U	UL,S
108-95-2	Phenol	390	U	
111-44-4	Bis(2-chloroethyl)ether	390	U	
95-57-8	2-Chlorophenol	390	U	
95-48-7	2-Methylphenol	390	U	
108-60-1	2,2'-oxybis(1-Chloropropane)	390	U	
98-86-2	Acetophenone	390	U	
106-44-5	4-Methylphenol	390	U	
621-64-7	N-Nitroso-di-N-propylamine	390	U	
67-72-1	Hexachloroethane	390	U	
98-95-3	Nitrobenzene	390	U	
78-59-1	Isophorone	390	U	
88-75-5	2-Nitrophenol	390	U	
105-67-9	2,4-Dimethylphenol	390	U	
111-91-1	Bis(2-chloroethoxy)methane	390	U	
120-83-2	2,4-Dichlorophenol	390	U	
91-20-3	Naphthalene	390	U	
106-47-8	4-Chloroaniline	390	U	
87-68-3	Hexachlorobutadiene	390	U	
105-60-2	Caprolactam	390	U	
59-50-7	4-Chloro-3-methylphenol	390	U	
91-57-6	2-Methylnaphthalene	390	U	
77-47-4	Hexachlorocyclopentadiene	390	U	
88-06-2	2,4,6-Trichlorophenol	390	U	
95-95-4	2,4,5-Trichlorophenol	390	U	
92-52-4	1,1'-Biphenyl	390	U	
91-58-7	2-Chloronaphthalene	390	U	
88-74-4	2-Nitroaniline	790	U	
131-11-3	Dimethylphthalate	31	J	L,S
606-20-2	2,6-Dinitrotoluene	800		
208-96-8	Acenaphthylene	390	U	UL,S
99-09-2	3-Nitroaniline	790	U	
83-32-9	Acenaphthene	390	U	

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-14RE

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-8RA64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	2000	U
100-02-7	4-Nitrophenol	790	U
121-14-2	2,4-Dinitrotoluene	9800	E
132-64-9	Dibenzofuran	390	U
84-66-2	Diethylphthalate	16000	E
7005-72-3	4-Chlorophenyl-phenylether	390	U
86-73-7	Fluorene	390	U
100-01-6	4-Nitroaniline	790	U
534-52-1	4,6-Dinitro-2-methylphenol	790	U
86-30-6	N-Nitrosodiphenylamine (1)	1300	
101-55-3	4-Bromophenyl-phenylether	390	U
118-74-1	Hexachlorobenzene	390	U
1912-24-9	Atrazine	390	U
87-86-5	Pentachlorophenol	390	U
85-01-8	Phenanthrene	35	J
120-12-7	Anthracene	390	U
86-74-8	Carbazole	390	U
84-74-2	Di-n-butylphthalate	9800	E
206-44-0	Fluoranthene	84	J
129-00-0	Pyrene	92	J
85-68-7	Butylbenzylphthalate	390	U
91-94-1	3,3'-Dichlorobenzidine	390	U
117-81-7	bis(2-ethylhexyl)Phthalate	1500	
56-55-3	Benzo(a)anthracene	46	J
218-01-9	Chrysene	49	J
117-84-0	Di-n-octylphthalate	280	J
205-99-2	Benzo(b)fluoranthene	58	J
207-08-9	Benzo(k)fluoranthene	48	J
50-32-8	Benzo(a)pyrene	42	J
193-39-5	Indeno(1,2,3-cd)pyrene	37	J
53-70-3	Dibenzo(a,h)anthracene	390	U
191-24-2	Benzo(g,h,i)perylene	35	J

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-14RE

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-8RA64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/26/02

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN (BC)	5.30	330	JB
2.		UNKNOWN (BC)	5.61	910	JB
3.		UNKNOWN	10.88	220	J
4.		UNKNOWN	12.23	400	J
5.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.03	4800	NJ
6.	836-30-6	BENZENAMINE, 4-NITRO-N-PHENY	15.85	230	NJ
7.		UNKNOWN CARBOXYLIC ACID	16.90	180	J
8.		UNKNOWN CARBOXYLIC ACID	19.24	220	J
9.		UNKNOWN PHTHALATE	19.61	640	J
10.		UNKNOWN	19.66	270	J
11.		UNKNOWN PHTHALATE	19.69	400	J
12.		UNKNOWN PHTHALATE	19.75	390	J
13.		UNKNOWN PHTHALATE	19.83	240	J
14.		UNKNOWN PHTHALATE	19.90	280	J
15.		STRAIGHT-CHAIN ALKANE	20.85	160	J
16.		UNKNOWN	21.29	180	J
17.					
18.					
19.					
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FORM I SV-TIC

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-14REDL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-8RDA64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/26/02

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
100-52-7	Benzaldehyde	1600	U
108-95-2	Phenol	1600	U
111-44-4	Bis(2-chloroethyl)ether	1600	U
95-57-8	2-Chlorophenol	1600	U
95-48-7	2-Methylphenol	1600	U
108-60-1	2,2'-oxybis(1-Chloropropane)	1600	U
98-86-2	Acetophenone	1600	U
106-44-5	4-Methylphenol	1600	U
621-64-7	N-Nitroso-di-N-propylamine	1600	U
67-72-1	Hexachloroethane	1600	U
98-95-3	Nitrobenzene	1600	U
78-59-1	Isophorone	1600	U
88-75-5	2-Nitrophenol	1600	U
105-67-9	2,4-Dimethylphenol	1600	U
111-91-1	Bis(2-chloroethoxy)methane	1600	U
120-83-2	2,4-Dichlorophenol	1600	U
91-20-3	Naphthalene	1600	U
106-47-8	4-Chloroaniline	1600	U
87-68-3	Hexachlorobutadiene	1600	U
105-60-2	Caprolactam	1600	U
59-50-7	4-Chloro-3-methylphenol	1600	U
91-57-6	2-Methylnaphthalene	1600	U
77-47-4	Hexachlorocyclopentadiene	1600	U
88-06-2	2,4,6-Trichlorophenol	1600	U
95-95-4	2,4,5-Trichlorophenol	1600	U
92-52-4	1,1'-Biphenyl	1600	U
91-58-7	2-Chloronaphthalene	1600	U
88-74-4	2-Nitroaniline	3100	U
131-11-3	Dimethylphthalate	1600	U
606-20-2	2,6-Dinitrotoluene	840	DJ
208-96-8	Acenaphthylene	1600	U
99-09-2	3-Nitroaniline	3100	U
83-32-9	Acenaphthene	1600	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

D-14REDL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-8RDA64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted: 12/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/26/02

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	7900	U
100-02-7	4-Nitrophenol	3100	U
121-14-2	2,4-Dinitrotoluene	11000	D
132-64-9	Dibenzofuran	1600	U
84-66-2	Diethylphthalate	18000	D
7005-72-3	4-Chlorophenyl-phenylether	1600	U
86-73-7	Fluorene	1600	U
100-01-6	4-Nitroaniline	3100	U
534-52-1	4,6-Dinitro-2-methylphenol	3100	U
86-30-6	N-Nitrosodiphenylamine (1)	1800	D
101-55-3	4-Bromophenyl-phenylether	1600	U
118-74-1	Hexachlorobenzene	1600	U
1912-24-9	Atrazine	1600	U
87-86-5	Pentachlorophenol	1600	U
85-01-8	Phenanthrene	1600	U
120-12-7	Anthracene	1600	U
86-74-8	Carbazole	1600	U
84-74-2	Di-n-butylphthalate	11000	D
206-44-0	Fluoranthene	1600	U
129-00-0	Pyrene	1600	U
85-68-7	Butylbenzylphthalate	1600	U
91-94-1	3,3'-Dichlorobenzidine	1600	U
117-81-7	bis(2-ethylhexyl)Phthalate	1500	D
56-55-3	Benzo(a)anthracene	1600	U
218-01-9	Chrysene	1600	U
117-84-0	Di-n-octylphthalate	1600	U
205-99-2	Benzo(b)fluoranthene	1600	U
207-08-9	Benzo(k)fluoranthene	1600	U
50-32-8	Benzo(a)pyrene	1600	U
193-39-5	Indeno(1,2,3-cd)pyrene	1600	U
53-70-3	Dibenzo(a,h)anthracene	1600	U
191-24-2	Benzo(g,h,i)perylene	1600	U

(1) - Cannot be separated from Diphenylamine

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

D-14REDL

Lab Name: COMPUCHEM Method: 8270C

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: V2810-8RDA64

Level: (low/med) LOW Date Received: 12/11/02

% Moisture: 16 decanted: (Y/N) N Date Extracted:12/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/26/02

Injection Volume: 1.0(uL) Dilution Factor: 4.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~UNKNOWN (BC)~~	~~5.59~~	~~1300~~	~~JBD~~
2.	119-75-5	BENZENAMINE, 2-NITRO-N-PHENY	13.01	5200	NJD NJ
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB39A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-3

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 18 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 01/08/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	51	U
83-32-9	Acenaphthene	51	U
86-73-7	Fluorene	51	U
129-00-0	Pyrene	21	U
85-01-8	Phenanthrene	51	U
120-12-7	Anthracene	51	U
206-44-0	Fluoranthene	21	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	51	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB39B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-4

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 6 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 01/08/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	45	U
83-32-9	Acenaphthene	45	U
86-73-7	Fluorene	45	U
129-00-0	Pyrene	18	U
85-01-8	Phenanthrene	45	U
120-12-7	Anthracene	45	U
206-44-0	Fluoranthene	18	U
218-01-9	Chrysene	8.8	U
205-99-2	Benzo(b)fluoranthene	8.8	U
207-08-9	Benzo(k)fluoranthene	8.8	U
53-70-3	Dibenzo(a,h)anthracene	8.8	U
191-24-2	Benzo(g,h,i)perylene	8.8	U
56-55-3	Benzo(a)anthracene	8.8	U
50-32-8	Benzo(a)pyrene	8.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	8.8	U
208-96-8	Acenaphthylene	45	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB40A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-5

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 19 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	52	U
83-32-9	Acenaphthene	34	JP J
86-73-7	Fluorene	52	U
129-00-0	Pyrene	21	U
85-01-8	Phenanthrene	52	U
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	21	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	52	U

AMENDED DATA

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB40B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-6

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 12 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 01/08/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	48	U
83-32-9	Acenaphthene	48	U
86-73-7	Fluorene	48	U
129-00-0	Pyrene	19	U
85-01-8	Phenanthrene	48	U
120-12-7	Anthracene	48	U
206-44-0	Fluoranthene	19	U
218-01-9	Chrysene	9.4	U
205-99-2	Benzo(b)fluoranthene	9.4	U
207-08-9	Benzo(k)fluoranthene	9.4	U
53-70-3	Dibenzo(a,h)anthracene	9.4	U
191-24-2	Benzo(g,h,i)perylene	9.4	U
56-55-3	Benzo(a)anthracene	9.4	U
50-32-8	Benzo(a)pyrene	9.4	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.4	U
208-96-8	Acenaphthylene	48	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB42A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-7

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	660	
83-32-9	Acenaphthene	50	U
86-73-7	Fluorene	50	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	50	U
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	92	PJ19
207-08-9	Benzo(k)fluoranthene	9.9	U
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	9.9	U
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	50	U

AMENDED DATA

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB42B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-9

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	150	P J/8
83-32-9	Acenaphthene	50	U
86-73-7	Fluorene	50	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	50	U
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	9.9	U
207-08-9	Benzo(k)fluoranthene	9.9	U
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	9.9	U
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	50	U

AMENDED DATA

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB52A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 20 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 01/08/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	52	U
83-32-9	Acenaphthene	52	U
86-73-7	Fluorene	52	U
129-00-0	Pyrene	21	U
85-01-8	Phenanthrene	52	U
120-12-7	Anthracene	52	U
206-44-0	Fluoranthene	21	U
218-01-9	Chrysene	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
56-55-3	Benzo(a)anthracene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
208-96-8	Acenaphthylene	52	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB52B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-2

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 11 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	750	
83-32-9	Acenaphthene	1600	EP JJg
86-73-7	Fluorene	47	U
129-00-0	Pyrene	10	JP JJg
85-01-8	Phenanthrene	47	U
120-12-7	Anthracene	47	U
206-44-0	Fluoranthene	54	P J,J
218-01-9	Chrysene	9.0	JP JJg
205-99-2	Benzo(b)fluoranthene	54	P J,J
207-08-9	Benzo(k)fluoranthene	9.3	U
53-70-3	Dibenzo(a,h)anthracene	9.3	U
191-24-2	Benzo(g,h,i)perylene	9.3	U
56-55-3	Benzo(a)anthracene	6.6	JP JJg
50-32-8	Benzo(a)pyrene	74	P
193-39-5	Indeno(1,2,3-cd)pyrene	15	P
208-96-8	Acenaphthylene	47	U

RA 3/7/03

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB53A

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-10

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted: 12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 12/30/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	50	U
83-32-9	Acenaphthene	3000	EP J,g
86-73-7	Fluorene	50	U
129-00-0	Pyrene	11	J
85-01-8	Phenanthrene	21	JP J,g
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	28	P J,g
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	72	P J,g
207-08-9	Benzo(k)fluoranthene	6.7	J J,C
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	9.9	U
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	50	U

RA 3/7/03

AMENDED DATA

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB53B

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-11

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 15 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 01/09/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	49	U
83-32-9	Acenaphthene	49	U
86-73-7	Fluorene	21	J
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	49	U
120-12-7	Anthracene	49	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.8	U
205-99-2	Benzo(b)fluoranthene	9.8	U
207-08-9	Benzo(k)fluoranthene	9.8	U
53-70-3	Dibenzo(a,h)anthracene	9.8	U
191-24-2	Benzo(g,h,i)perylene	9.8	U
56-55-3	Benzo(a)anthracene	9.8	U
50-32-8	Benzo(a)pyrene	9.8	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.8	U
208-96-8	Acenaphthylene	49	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-14

Lab Name: COMPUCHEM Contract: 8310

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 30.0 (g/mL) G Lab File ID: _____

% Moisture: 16 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) SONC Date Extracted:12/16/02

Concentrated Extract Volume: 5000(ul) Date Analyzed: 01/09/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
91-20-3	Naphthalene	50	U
83-32-9	Acenaphthene	50	U
86-73-7	Fluorene	50	U
129-00-0	Pyrene	20	U
85-01-8	Phenanthrene	50	U
120-12-7	Anthracene	50	U
206-44-0	Fluoranthene	20	U
218-01-9	Chrysene	9.9	U
205-99-2	Benzo(b)fluoranthene	9.9	U
207-08-9	Benzo(k)fluoranthene	9.9	U
53-70-3	Dibenzo(a,h)anthracene	9.9	U
191-24-2	Benzo(g,h,i)perylene	9.9	U
56-55-3	Benzo(a)anthracene	9.9	U
50-32-8	Benzo(a)pyrene	9.9	U
193-39-5	Indeno(1,2,3-cd)pyrene	9.9	U
208-96-8	Acenaphthylene	50	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB39A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/02/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R, Q
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

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GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB39B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/02/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R, Q
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB40A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/02/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R, R
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB40B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/02/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	UR, Q
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB42A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R, J
121-14-2	2,4-Dinitrotoluene	0.70	J J, C
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB42B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, L
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R, L
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB52A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/02/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR,L
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	UR,L
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB52B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/02/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R, Q
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB53A

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U R, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U R, L
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB53B

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	UR, Q
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	1.0	U
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	UR, Q
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-14

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/01/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
2691-41-0	HMX	1.0	U
99-35-4	1,3,5-Trinitrobenzene	1.0	U
121-82-4	RDX	1.0	U
99-65-0	1,3-Dinitrobenzene	1.0	U
118-96-7	2,4,6-Trinitrotoluene	0.82	J
479-45-8	Tetryl	2.0	U
98-95-3	Nitrobenzene	1.0	U
121-14-2	2,4-Dinitrotoluene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1.0	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1.0	U
88-72-2	2-Nitrotoluene	1.0	U
99-99-0	4-Nitrotoluene	1.0	U
99-08-1	3-Nitrotoluene	1.0	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB39A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-3

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/05/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB39B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-4

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/05/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB40A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-5

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/05/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB40B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-6

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/05/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB42A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-7

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/05/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB42B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-9

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/05/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB52A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-1

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/05/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB52B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-2

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/05/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB53A

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-10

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/05/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54SB53B

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-11

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/05/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	10	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

D-14

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix: (soil/water) SOIL Lab Sample ID: V2810-8

Sample wt/vol: 2.0 (g/mL) G Lab File ID: _____

% Moisture: 0 decanted: (Y/N) N Date Received: 12/11/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/17/02

Concentrated Extract Volume: 10000(ul) Date Analyzed: 01/11/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG	Q
55-63-0	Nitroglycerin	190	

AMENDED DATA

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.: 54SB39A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-3

Level (low/med): LOW Date Received: 12/11/02

% Solids: 82.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	17300			P	
7440-36-0	Antimony	0.44	B	N	P	E,P
7440-38-2	Arsenic	1.7			P	
7440-39-3	Barium	112		*	P	
7440-41-7	Beryllium	0.82			P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	1290			P	
7440-47-3	Chromium	24.1			P	
7440-48-4	Cobalt	12.0			P	
7440-50-8	Copper	11.3			P	
7439-89-6	Iron	25200			P	
7439-92-1	Lead	10.0			P	
7439-95-4	Magnesium	4470			P	
7439-96-5	Manganese	442			P	
7439-97-6	Mercury	0.020	B		CV	
7440-02-0	Nickel	14.1		E	P	J/S
7440-09-7	Potassium	1760		E	P	
7782-49-2	Selenium	0.97			P	B,Z
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	70.0	B		P	K,W
7440-28-0	Thallium	0.29	U	N	P	~~U Lpot~~ R,M 4/3/03
7440-62-2	Vanadium	45.9			P	
7440-66-6	Zinc	63.5			P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB39B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-4

Level (low/med): LOW Date Received: 12/11/02

% Solids: 94.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10300			P	
7440-36-0	Antimony	0.33	B	N	P	E, P
7440-38-2	Arsenic	1.4			P	
7440-39-3	Barium	81.5		*	P	
7440-41-7	Beryllium	0.54			P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	1200			P	
7440-47-3	Chromium	16.0			P	
7440-48-4	Cobalt	7.0			P	
7440-50-8	Copper	9.7			P	
7439-89-6	Iron	17400			P	
7439-92-1	Lead	6.2			P	
7439-95-4	Magnesium	3380			P	
7439-96-5	Manganese	284			P	
7439-97-6	Mercury	0.018	U		CV	
7440-02-0	Nickel	10.0		E	P	J, S
7440-09-7	Potassium	1320		E	P	↓
7782-49-2	Selenium	0.52			P	B, X
7440-22-4	Silver	0.08	U		P	
7440-23-5	Sodium	94.0	B		P	K, W
7440-28-0	Thallium	0.24	U	N	P	~~J, L, W~~ R, M R4 3/4/05
7440-62-2	Vanadium	29.0			P	
7440-66-6	Zinc	39.5			P	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB40A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-5

Level (low/med): LOW Date Received: 12/11/02

% Solids: 81.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13600			P	
7440-36-0	Antimony	0.46	B	N	P	B,P
7440-38-2	Arsenic	1.7			P	
7440-39-3	Barium	103		*	P	
7440-41-7	Beryllium	0.68			P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	1220			P	
7440-47-3	Chromium	20.8			P	
7440-48-4	Cobalt	8.5			P	
7440-50-8	Copper	13.0			P	
7439-89-6	Iron	21100			P	
7439-92-1	Lead	18.5			P	
7439-95-4	Magnesium	4010			P	
7439-96-5	Manganese	400			P	
7439-97-6	Mercury	0.023	B		CV	
7440-02-0	Nickel	12.4		E	P	J,S
7440-09-7	Potassium	1810		E	P	↓
7782-49-2	Selenium	0.73			P	B,X
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	67.6	B		P	K,W
7440-28-0	Thallium	0.27	U	N	P	~~J,S~~ K,M RA 3/3/03
7440-62-2	Vanadium	36.3			P	
7440-66-6	Zinc	63.6			P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB40B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-6

Level (low/med): LOW Date Received: 12/11/02

% Solids: 87.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13100			P	
7440-36-0	Antimony	0.39	B	N	P	E,P
7440-38-2	Arsenic	1.3			P	
7440-39-3	Barium	98.4		*	P	
7440-41-7	Beryllium	0.67			P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	1100			P	
7440-47-3	Chromium	21.8			P	
7440-48-4	Cobalt	7.2			P	
7440-50-8	Copper	10.9			P	
7439-89-6	Iron	19900			P	
7439-92-1	Lead	7.3			P	
7439-95-4	Magnesium	3350			P	
7439-96-5	Manganese	302			P	
7439-97-6	Mercury	0.021	B		CV	
7440-02-0	Nickel	12.1		E	P	J,S
7440-09-7	Potassium	1630		E	P	↓
7782-49-2	Selenium	0.67			P	B,K
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	92.7	B		P	K,W
7440-28-0	Thallium	0.26	U	N	P	~~U,W~~ R,M RA 1/13/03
7440-62-2	Vanadium	35.7			P	
7440-66-6	Zinc	49.9			P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB42A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-7

Level (low/med): LOW Date Received: 12/11/02

% Solids: 83.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	13700			P	
7440-36-0	Antimony	1.4		N	P	L,M
7440-38-2	Arsenic	2.8			P	
7440-39-3	Barium	158		*	P	
7440-41-7	Beryllium	0.77			P	
7440-43-9	Cadmium	0.33	B		P	
7440-70-2	Calcium	4770			P	
7440-47-3	Chromium	23.0			P	
7440-48-4	Cobalt	9.7			P	
7440-50-8	Copper	63.3			P	
7439-89-6	Iron	23600			P	
7439-92-1	Lead	1940			P	
7439-95-4	Magnesium	3860			P	
7439-96-5	Manganese	785			P	
7439-97-6	Mercury	0.43			CV	
7440-02-0	Nickel	13.1		E	P	J,S
7440-09-7	Potassium	1340		E	P	↓
7782-49-2	Selenium	1.2			P	B,X
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	33.4	U		P	
7440-28-0	Thallium	0.26	U	N	P	~~U,L,W~~ R,M RP 3/13/03
7440-62-2	Vanadium	31.4			P	
7440-66-6	Zinc	371			P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB42B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-9

Level (low/med): LOW Date Received: 12/11/02

% Solids: 83.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12900			P	
7440-36-0	Antimony	0.42	B	N	P	B,P
7440-38-2	Arsenic	1.5			P	
7440-39-3	Barium	95.7		*	P	
7440-41-7	Beryllium	0.63			P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	1290			P	
7440-47-3	Chromium	19.4			P	
7440-48-4	Cobalt	7.5			P	
7440-50-8	Copper	12.0			P	
7439-89-6	Iron	20600			P	
7439-92-1	Lead	12.7			P	
7439-95-4	Magnesium	4080			P	
7439-96-5	Manganese	315			P	
7439-97-6	Mercury	0.019	U		CV	
7440-02-0	Nickel	11.8		E	P	J,S
7440-09-7	Potassium	2910		E	P	↓
7782-49-2	Selenium	0.60			P	B,Z
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	132	B		P	K,W
7440-28-0	Thallium	0.28	U	N	P	~~K,W~~ K,M RP 3/5/03
7440-62-2	Vanadium	36.2			P	
7440-66-6	Zinc	53.7			P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB52A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-1

Level (low/med): LOW Date Received: 12/11/02

% Solids: 79.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	16900			P	
7440-36-0	Antimony	0.57	B	N	P	B,P
7440-38-2	Arsenic	2.0			P	
7440-39-3	Barium	92.7		*	P	
7440-41-7	Beryllium	0.80			P	
7440-43-9	Cadmium	0.04	U		P	
7440-70-2	Calcium	719			P	
7440-47-3	Chromium	22.2			P	
7440-48-4	Cobalt	10.7			P	
7440-50-8	Copper	11.1			P	
7439-89-6	Iron	26000			P	
7439-92-1	Lead	10.5			P	
7439-95-4	Magnesium	2140			P	
7439-96-5	Manganese	393			P	
7439-97-6	Mercury	0.039	B		CV	
7440-02-0	Nickel	11.9		E	P	J,S
7440-09-7	Potassium	1320		E	P	↓
7782-49-2	Selenium	0.73			P	B,L
7440-22-4	Silver	0.10	U		P	
7440-23-5	Sodium	244	B		P	K,W
7440-28-0	Thallium	0.30	U	N	P	~~U,W~~ K,W K,M KA 3/9/05
7440-62-2	Vanadium	54.6			P	
7440-66-6	Zinc	47.1			P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB52B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-2

Level (low/med): LOW Date Received: 12/11/02

% Solids: 88.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10000			P	
7440-36-0	Antimony	0.35	B	N	P	S,P
7440-38-2	Arsenic	1.1	B		P	
7440-39-3	Barium	50.4		*	P	
7440-41-7	Beryllium	0.52	B		P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	313			P	
7440-47-3	Chromium	10.9			P	
7440-48-4	Cobalt	4.5			P	
7440-50-8	Copper	6.0			P	
7439-89-6	Iron	14900			P	
7439-92-1	Lead	4.0			P	
7439-95-4	Magnesium	1490			P	
7439-96-5	Manganese	215			P	
7439-97-6	Mercury	0.016	U		CV	
7440-02-0	Nickel	7.6		E	P	J,S
7440-09-7	Potassium	627		E	P	↓
7782-49-2	Selenium	0.73			P	B,Z
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	119	B		P	K,W
7440-28-0	Thallium	0.27	U	N	P	~~K,W~~ R,M EA 4/3/03
7440-62-2	Vanadium	24.9			P	
7440-66-6	Zinc	26.5			P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54SB53A

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-10

Level (low/med): LOW Date Received: 12/11/02

% Solids: 84.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12800			P	
7440-36-0	Antimony	0.53	B	N	P	B,P
7440-38-2	Arsenic	1.5			P	
7440-39-3	Barium	132		*	P	
7440-41-7	Beryllium	0.75			P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	1380			P	
7440-47-3	Chromium	20.7			P	
7440-48-4	Cobalt	8.3			P	
7440-50-8	Copper	20.9			P	
7439-89-6	Iron	19500			P	
7439-92-1	Lead	75.7			P	
7439-95-4	Magnesium	3550			P	
7439-96-5	Manganese	469			P	
7439-97-6	Mercury	0.12			CV	
7440-02-0	Nickel	12.6		E	P	J/S
7440-09-7	Potassium	1670		E	P	↓
7782-49-2	Selenium	0.56	B		P	B,P
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	128	B		P	K,W
7440-28-0	Thallium	0.27	U	N	P	~~W,W~~ G,M KH/3/3/03
7440-62-2	Vanadium	32.6			P	
7440-66-6	Zinc	85.9			P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.
54SB53B

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-11

Level (low/med): LOW Date Received: 12/11/02

% Solids: 85.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10700			P	
7440-36-0	Antimony	0.41	B	N	P	C:P
7440-38-2	Arsenic	0.99	B		P	
7440-39-3	Barium	96.4		*	P	
7440-41-7	Beryllium	0.63			P	
7440-43-9	Cadmium	0.03	U		P	
7440-70-2	Calcium	1280			P	
7440-47-3	Chromium	17.4			P	
7440-48-4	Cobalt	7.6			P	
7440-50-8	Copper	9.0			P	
7439-89-6	Iron	16900			P	
7439-92-1	Lead	6.1			P	
7439-95-4	Magnesium	3070			P	
7439-96-5	Manganese	316			P	
7439-97-6	Mercury	0.020	U		CV	
7440-02-0	Nickel	10.8		E	P	J,S
7440-09-7	Potassium	1280		E	P	↓
7782-49-2	Selenium	0.64			P	B,K
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	93.7	B		P	K,W
7440-28-0	Thallium	0.26	U	N	P	~~K,W~~ RA 5/3/05 K,M
7440-62-2	Vanadium	28.5			P	
7440-66-6	Zinc	45.3			P	

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

SW-846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

D-14

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: V2810

Matrix (soil/water): SOIL Lab Sample ID: V2810-8

Level (low/med): LOW Date Received: 12/11/02

% Solids: 83.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	12300			P	
7440-36-0	Antimony	1.9		N	P	L,M
7440-38-2	Arsenic	2.9			P	
7440-39-3	Barium	146		*	P	
7440-41-7	Beryllium	0.76			P	
7440-43-9	Cadmium	0.37	B		P	
7440-70-2	Calcium	5880			P	
7440-47-3	Chromium	22.1			P	
7440-48-4	Cobalt	8.5			P	
7440-50-8	Copper	60.6			P	
7439-89-6	Iron	23800			P	
7439-92-1	Lead	1270			P	
7439-95-4	Magnesium	4890			P	
7439-96-5	Manganese	982			P	
7439-97-6	Mercury	0.65			CV	
7440-02-0	Nickel	14.0		E	P	J,S
7440-09-7	Potassium	1330		E	P	↓
7782-49-2	Selenium	1.3			P	B,L
7440-22-4	Silver	0.09	U		P	
7440-23-5	Sodium	35.0	U		P	
7440-28-0	Thallium	0.28	U	N	P	~~U,L,W~~ KJA 3/3/03 K,M
7440-62-2	Vanadium	29.1			P	
7440-66-6	Zinc	405			P	

Color Before: BLACK Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: RA
Date: 2/27/03
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: V2810
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓	✓	
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		✓	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes: Not signed by lab, comment

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		L	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		✓	

Notes:

	collected	extract	analyzed
	12/10/02	12/16/02	12/22/02
	"	12/24/02	12/26/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	✓		

Notes:

GBB-14 in R2810 ND ✓

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	✓		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	✓		
4.4	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15% and %D ≤ 20%		✓	
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		✓	

Notes: CC 12/22/02 atrazine -82.8 ND → R/C

see attached

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	✓		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	✓		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	✓		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	✓		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?	✓		
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)		✓	
	1 or more <10% / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high Positives: L / J / L / K Non-detects: R / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes: Spl dilution D-14 → L,UL,S unless prev. flagged ... if Confirmed results HS
D-14 RE L,UL,S
D-14 RE base-neutral L,UL,S

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: diethylphthalate 50% 7QC pos ⇒ J,d in all samples. unless prev. flagged

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	If Yes, J(+) only.			

Notes: Atrazine 164, 154% 7QC all prev. flagged-

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	✓		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	✓		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		✓	

Notes:

545B42A		%RPD	D-14	545B42A	D-14	%RPD
2,6-Dinitrotoluene	830	183%	37	di-n-butylphthalate	12000	750	176%
2,4-DNT	12000	144%	170	bis(2-ethylhexyl	490	250	64%
diethylphthalate	4900	84%	2000				
N-nitrosodiphenylamine	1400	147%	210				

COMMENT

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).	✓		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	✓		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".	✓		

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 12 ✓			
12.1.2	Number of target compounds in each analysis: 46			
12.1.3	Number of results rejected and not reported: 10			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 95%			

Notes:

3332

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: RM
Date: 2/26/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: V2510
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓	✓	
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes: Not signed by lab, comment

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes: Collect 12/10/02 extract 12/16/02 analyzed 1/8/03, 1/29/03 1/9/03

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.	✓		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			

Notes: EQB-14 in R2SIC ND✓

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: ccc criteria met
Res, J,C
no flag to ND since acceptable on the other column-

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: Naphthalene 47/25, RPD 62 UJm in parent 545B52A

2a naphthylene RPD 70 QC No RPD, no flag

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			✓
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		✓	

Notes: D-14 545B42A

Naphthalene 1 ~~[illegible]~~ 50 U 660

Benzo(b) fluoranthene 9.9 U 92 comment

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

Solid 7.10% → J/g

10.0 Data Completeness

		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.1.1	Number of samples:_____			
10.1.3	Number of results rejected and not reported:_____			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: AJ
Date: 01/30/03
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: V2810
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?		X	
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: COC's not signed by lab receiving

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag **all** positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: cooler temp 2.0°C

sampled 12/10/02
extracted 12/17/02
analysis 01/05/03

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			X

Notes: No field/equipment blanks in this package.

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	X		
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).	X		
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? 50-150%	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	X		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS %R = -1170% MS/MSD sample D-14 a FD of SB42A
MSD %R = -1180% the parent sample is ND, therefore I flagged D-14 only as ~~the~~ no action ~~it~~

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits? 120% 50-150%		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: NO LCSD

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.		X	

Notes: D-14 = 545B42A
↓ ↓
130 10 U
↑ already flagged for MS/MSD issues

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	X	X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes: D-14 positive detect confirmed on 2nd column.

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 11			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RT
Date: 2/23/03
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: V-510
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓	✓	
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes, % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes: Not signed by lab, comment

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			✓
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes: collect 12/10/02 extract 12/17/02 analyzed 1/2/03

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		

3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	✓		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: See attached

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			✓
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			✓
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		

6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 1,3,5-TNB 13% MS prev flagged R,L also several RPD>QC
2,4,6-TNT 19% in D-14 Parent & No pos, no flag
Prev. flagged due to calib

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			✓
	Action: If Yes, J(+) only.			

Notes: 1,3,5-TNB 0% < 50-150% all ND R,L
Nitrobenzene 47%

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes:

	D-14	545B42A
2,4,6-TNT	.82	1U ok ✓
2,4-DNT	1U	0.7

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		

9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		✓	
10.1.1	Number of samples: 11			
10.1.3	Number of results rejected and not reported: 22			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness =			
	% Completeness = 66%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: V2810
Project No.: 15291524.00000

Project Name: Radford SWMU 54
Reviewer: E.A
Date: 2/20/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{O}C \pm 2\ ^{O}C$)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes, % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note:

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note: collect — analyzed
12/10/02 — 12/19/02 ICP
" — 12/20/02 Hg

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%?		✓				
	<50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						

Note:

aluminum 128.1
Fe 110.9
lead 83-7
Potassium 69.1
Se 123.4 ~~K no Dqualify~~ R per flagged for field blank.
Sodium 118 KiW
Tl 86.2 ~~UKiW~~ Kim
Zn 68.1

DO's < 2x RL KiW

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L						
4.5	Are there reported field blankor trip blank values > ± MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B						

CCB 14 ug/L
CCB 1.6
Se 3.7
Pos < 5X B, K

.605 Note: MB antimony .121 mg/kg all B, P — ICB neg. antimony, As, Ca, iron
-29.73 Ca -5.946 — Na, zinc
-1.42 Zn -.284 — CCB pos Mg, Se, K

pos either 5X or were prev. MB

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?	✓					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+) — Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.	✓			✓		

Note:

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓		
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L						
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	✓					✓

Note: antimony 35.8/38.1 Lim unless Prep flagged
Thallium 0/0 all ND → Rim

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note:
Nickel 10.4
K 15.1 J's in all samples

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		✓		✓		

Note: 545842A / D-14 Pb 41% RPD

comment

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓		
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note:

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples: 11						
13.1.2	Number of target compounds in each analysis: 23						
13.1.3	Number of results rejected and not reported: 11						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 95%						

Note:

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1039

Project Number	Project Name
C9604310	RFAAP

Project Contact (Name and Phone Number): Darren Rennie

Samplers: Fisher / Sparks

LAB: 5

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B52A	12/10/02 915	5		X	S	E		2		X	X			X		X							
545B52B	12/10/02 925	5		X	S	E		2		X	X			X		X							
545B41A	12/10/02 940	5		X	S	E		2		X	X			X		X							
545B41AMS	12/10/02 940	5		X	S	E		2		X	X			X		X							
545B41AMSD	12/10/02 940	5		X	S	E		2		X	X			X		X							
545B41B	12/10/02 950	5		X	S	E		2		X	X			X		X							
545B39A	12/10/02 1000	5		X	S	E		2		X	X			X		X							
545B39B	12/10/02 1010	5		X	S	E		2		X	X			X		X							
545B40A	12/10/02 1035	5		X	S	E		2		X	X			X		X							
545B40B	12/10/02 1045	5		X	S	E		2		X	X			X		X							
545B42A	12/10/02 1100	5		X	S	E		2		X	X			X		X							
D-14	12/10/02	5		X	S	E		2		X	X			X		X							
545B42B	12/10/02 1110	5		X	S	E		2		X	X			X		X							
~~545B~~																							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. (Soil) Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature] 12/10/02	1800				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1040

Project Number	Project Name
09604-310	RFAAP

Project Contact (Name and Phone Number): Darren Rennie

Samplers: Fisher / Spangler

LAB: 54

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B53A	12/10/02 1245	5		X	S	E		2		X	X			X		X							
545B53B	12/10/02 1255	5		X	S	E		2		X	X			X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other ___
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other ___

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Bill Lee 12/10/02	1800				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: ___W2810 & X2810____ **Fraction:** ___Explosives, Nitroglycerin, Metals____

Lab: _____CompuChem_____ **Project Name:** _____Radford SWMU 54_____

Reviewer: _____JA, AJ_____ **Date:** _____March 3, 2003_____

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the explosive analyses, the LCS recoveries for HMX (29%), 1,3,5-trinitrobenzene (40%), RDX (18%), 1,3-dinitrobenzene (40%), 2,4,6-trinitrotoluene (35%), tetryl (46%), nitrobenzene (35%), 2,4-dinitrotoluene (48%), 2,6-dinitrotoluene (35%), 2-amino-4,6-dinitrotoluene (38%), 4-amino-2,6-dinitrotoluene (33%), 2-nitrotoluene (41%), 4-nitrotoluene (33%), and 3-nitrotoluene (36%) were less than the lower QC limit (i.e., 50%). All positive detections, except those previously flagged due to blank contamination, were flagged "J,l" and non-detects were flagged "R,l". The percent completeness was less than the QC limit (i.e., 90%) at 4.8% due to this anomaly.

Minor Anomalies: For the explosive analyses, the method blank contained 2,4,6-trinitrotoluene at 0.58 µg/L. The positive 2,4,6-trinitrotoluene result in sample 54DPW2 was flagged "B,z". The continuing calibration verification (CCV) analyzed on 12/29/02 at 00:22 displayed %Ds on the primary column (C18) greater than the control limit (i.e., 15%) with a positive bias for 2,4,6-trinitrotoluene at 19.01% and 2,4-dinitrotoluene at 22.49%, and with a negative bias for 4-amino-2,6-dinitrotoluene at 16.29%. The CCV analyzed on 12/29/02 at 08:53 displayed %Ds on the primary column (C18) greater than the control limit with a positive bias for 2,4,6-trinitrotoluene at 28.14% and 2,4-dinitrotoluene at 31.96%, and with a negative bias for 4-amino-2,6-dinitrotoluene at 17.45%. The CCV analyzed on 1/3/03 at 02:40 displayed a %D on the primary column (C18) greater than the control limit with a positive bias for 2,4,6-trinitrotoluene at 19.62%. The CCV analyzed on 1/10/03 at 02:30 displayed %Ds on the confirmation column (Pinnacle Cyano) greater than the control limit with a positive bias for HMX at 15.21% and with a negative bias for 3-nitrotoluene at 15.97%. Since all associated sample results were previously flagged due to other QC failures, no further data qualifying action was taken.

The 1,4-dinitrobenzene surrogate recoveries were less than the lower control limit (i.e., 39%) on both columns in sample 54DPW2 (14% and 30%). The retention time for this surrogate was slightly outside the retention time window on the primary column (C18). Since all results in this sample were previously flagged due to other QC failures, no further data qualifying action was taken.

The MS/MSD recoveries for 2,4,6-trinitrotoluene (36%/42%) were less than the lower control limit (i.e., 50%) in the 54DPW2 MS/MSD pair. The relative percent difference was greater than the acceptance limit (i.e., 30%) for 2-nitrotoluene at 40%. Since all associated sample results were previously flagged due to other QC failures, no further data qualifying action was taken.

For the nitroglycerin analyses, the 1,4-dinitrobenzene surrogate recovery was less than the lower control limit (i.e., 50%) on the primary column in sample 54DPW2 (16%). The nitroglycerin was not detected in this sample and the non-detect result was flagged "UL,s".

The MS/MSD recoveries for nitroglycerin (38%/35%) were less than the lower control limit (i.e., 50%) in the 54DPW2 MS/MSD pair. Since the nitroglycerin result in parent sample 54DPW2 was previously flagged due to surrogate recovery failure, no further data qualifying action was taken.

For the total metal analyses (W2810), the CRDL percent recoveries for aluminum (111.1%), lead (137.7%), selenium (114.0%), sodium (78%), and thallium (113.4%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "K,w" for aluminum, lead, and selenium in the associated samples. All associated sample results were either non-detects for thallium or greater than 2xCRDL for sodium and no data qualifying action was required.

The preparation blank contained barium at 0.361 µg/L, magnesium at 58.302 µg/L, silver at -0.808 µg/L, and zinc 1.424 µg/L. Silver was also detected in one continuing calibration blank at -0.7 µg/L. Silver was not detected in the associated samples and non-detects were flagged "UL,p" due to the possibility of a negative drift in the instrument that may give rise to a detection limit with a low bias. Since barium, magnesium, and zinc results were greater than five times the blank concentration in the associated samples, no data qualifying action was taken.

Antimony, arsenic, barium, calcium, magnesium, potassium, and zinc were also detected in the initial calibration blank (ICB) and/or continuing calibration blanks (CCBs) at low levels. Since all results in the associated samples were either non-detects or greater than five times the blank concentration, no data qualifying action was taken.

For the dissolved metal analyses (X2810), the CRDL percent recoveries for aluminum (112.0%), cadmium (116.0%), copper (67%), potassium (117.3%), selenium (66.0%), and sodium (79.8%) were outside the control limit (i.e., 90-110%). Positive results less than 2xCRDL were flagged "K, w" for aluminum and potassium and were flagged "L,w" for selenium in the associated samples. Copper was not detected in the associated samples and non-detects were flagged "UL,w". All associated sample results were either non-detects for cadmium or greater than 2xCRDL for sodium and no data qualifying action was required.

The preparation blank contained barium at 0.38 µg/L, magnesium at 63.285 µg/L, and zinc at 1.18 µg/L. Barium, beryllium, copper, and magnesium were also detected in the initial calibration blank (ICB) and/or continuing calibration blanks (CCBs) at low levels. Since all results in the associated samples were either non-detects or greater than five times the blank concentration, no data qualifying action was taken.

The MS/MSD recoveries for arsenic (52.2% and 52.3%) and thallium (69.5% and 74.7%) were less than the lower control limit (i.e., 75%) in the 54DPW1 MS/MSD pair. The post-digestion spike analysis was not performed by the laboratory. Arsenic and thallium were not detected in the associated samples and non-detects were flagged "UL,m".

The serial dilution %D was greater than the QC limit (i.e., 10%) for zinc at 10.5%. Positive zinc results were flagged "J,s" in all samples.

Correctable Anomalies: None.

Comments: Except for data flagged "R", all data, as qualified, are usable for their intended purpose based on the data reviewed.

Signed: _____

SAMPLENUM	CLIENTID	QUOTENUMREF	LOGINNUM	MATNUM	ACCTNUM	PROJECTNUM	RECEIVEDATE
W2810-1	54DPW1	Q2810	W2810	WA	URS	RADFORD SWMU 54	12/12/02
W2810-2	54DPW2	Q2810	W2810	WA	URS	RADFORD SWMU 54	12/12/02
W2810-3	54DPW3	Q2810	W2810	WA	URS	RADFORD SWMU 54	12/12/02

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54DPW1

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: W2810

Matrix: (soil/water) WATER Lab Sample ID: W2810-1

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/13/02

Concentrated Extract Volume: 24000(ul) Date Analyzed: 12/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
2691-41-0	HMX	2.6	J	J.1
99-35-4	1,3,5-Trinitrobenzene	7.2	U	R.1
121-82-4	RDX	7.2	U	
99-65-0	1,3-Dinitrobenzene	7.2	U	
118-96-7	2,4,6-Trinitrotoluene	7.2	U	
479-45-8	Tetryl	9.6	U	
98-95-3	Nitrobenzene	7.2	U	
121-14-2	2,4-Dinitrotoluene	7.2	U	
606-20-2	2,6-Dinitrotoluene	9.6	U	
35572-78-2	2-Amino-4,6-dinitrotoluene	9.6	U	
1946-51-0	4-Amino-2,6-dinitrotoluene	9.6	U	
88-72-2	2-Nitrotoluene	7.2	U	
99-99-0	4-Nitrotoluene	7.2	U	
99-08-1	3-Nitrotoluene	7.2	U	V

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54DPW2

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: W2810

Matrix: (soil/water) WATER Lab Sample ID: W2810-2

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/13/02

Concentrated Extract Volume: 11000(ul) Date Analyzed: 01/03/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	4.4	U
99-35-4	1,3,5-Trinitrobenzene	3.3	U
121-82-4	RDX	3.3	U
99-65-0	1,3-Dinitrobenzene	3.3	U
118-96-7	2,4,6-Trinitrotoluene	1.5	JB
479-45-8	Tetryl	4.4	U
98-95-3	Nitrobenzene	3.3	U
121-14-2	2,4-Dinitrotoluene	3.3	U
606-20-2	2,6-Dinitrotoluene	4.4	U
35572-78-2	2-Amino-4,6-dinitrotoluene	4.4	U
1946-51-0	4-Amino-2,6-dinitrotoluene	4.4	U
88-72-2	2-Nitrotoluene	3.3	U
99-99-0	4-Nitrotoluene	3.3	U
99-08-1	3-Nitrotoluene	3.3	U

R.1 ↓ B,Z R.1 ↓

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54DPW3

Lab Name: COMPUCHEM Contract: 8330

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: W2810

Matrix: (soil/water) WATER Lab Sample ID: W2810-3

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/13/02

Concentrated Extract Volume: 7000(ul) Date Analyzed: 12/29/02

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
2691-41-0	HMX	2.8	U
99-35-4	1,3,5-Trinitrobenzene	2.1	U
121-82-4	RDX	2.1	U
99-65-0	1,3-Dinitrobenzene	2.1	U
118-96-7	2,4,6-Trinitrotoluene	2.1	U
479-45-8	Tetryl	2.8	U
98-95-3	Nitrobenzene	2.1	U
121-14-2	2,4-Dinitrotoluene	2.1	U
606-20-2	2,6-Dinitrotoluene	2.8	U
35572-78-2	2-Amino-4,6-dinitrotoluene	2.8	U
1946-51-0	4-Amino-2,6-dinitrotoluene	2.8	U
88-72-2	2-Nitrotoluene	2.1	U
99-99-0	4-Nitrotoluene	2.1	U
99-08-1	3-Nitrotoluene	2.1	U

R.1

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54DPW1

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: W2810

Matrix: (soil/water) WATER Lab Sample ID: W2810-1

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/13/02

Concentrated Extract Volume: 24000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	140	U

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54DPW2

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: W2810

Matrix: (soil/water) WATER Lab Sample ID: W2810-2

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/13/02

Concentrated Extract Volume: 11000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
55-63-0	Nitroglycerin	66	U	UL,S

1D

GC EXTRACTABLE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

54DPW3

Lab Name: COMPUCHEM Contract: 8332

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: W2810

Matrix: (soil/water) WATER Lab Sample ID: W2810-3

Sample wt/vol: 770.0 (g/ml) ML Lab File ID: _____

% Moisture: _____ decanted: (Y/N)___ Date Received: 12/12/02

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:12/13/02

Concentrated Extract Volume: 7000(ul) Date Analyzed: 01/06/03

Injection Volume: 25.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
55-63-0	Nitroglycerin	42	U

SW846 METALS
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54DPW1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: W2810

Matrix (soil/water): WATER Lab Sample ID: W2810-1

Level (low/med): LOW Date Received: 12/12/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	232			P	
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	2.5	U		P	
7440-39-3	Barium	154			P	
7440-41-7	Beryllium	0.10	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	80700			P	
7440-47-3	Chromium	2.1	B		P	
7440-48-4	Cobalt	0.97	B		P	
7440-50-8	Copper	1.4	U		P	
7439-89-6	Iron	376			P	
7439-92-1	Lead	2.7	B		P	F,W
7439-95-4	Magnesium	29300			P	
7439-96-5	Manganese	46.6			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	7.5			P	
7440-09-7	Potassium	1350			P	
7782-49-2	Selenium	3.3	U		P	
7440-22-4	Silver	0.70	U		P	UL,P
7440-23-5	Sodium	4900			P	
7440-28-0	Thallium	5.1	U		P	
7440-62-2	Vanadium	1.3	B		P	
7440-66-6	Zinc	26.5			P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54DPW2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: W2810

Matrix (soil/water): WATER Lab Sample ID: W2810-2

Level (low/med): LOW Date Received: 12/12/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	32000			P
7440-36-0	Antimony	3.7	U		P
7440-38-2	Arsenic	3.7	B		P
7440-39-3	Barium	537			P
7440-41-7	Beryllium	2.2	B		P
7440-43-9	Cadmium	0.40	U		P
7440-70-2	Calcium	72700			P
7440-47-3	Chromium	231			P
7440-48-4	Cobalt	11.6			P
7440-50-8	Copper	33.4			P
7439-89-6	Iron	41900			P
7439-92-1	Lead	19.4			P
7439-95-4	Magnesium	34500			P
7439-96-5	Manganese	340			P
7439-97-6	Mercury	0.16	B		CV
7440-02-0	Nickel	37.0			P
7440-09-7	Potassium	4920			P
7782-49-2	Selenium	4.1	B		P
7440-22-4	Silver	0.70	U		P
7440-23-5	Sodium	8310			P
7440-28-0	Thallium	5.1	U		P
7440-62-2	Vanadium	52.6			P
7440-66-6	Zinc	178			P

Color Before: BROWN Clarity Before: CLOUDY Texture:

Color After: BROWN Clarity After: CLOUDY Artifacts:

Comments:

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54DPW3

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: W2810

Matrix (soil/water): WATER Lab Sample ID: W2810-3

Level (low/med): LOW Date Received: 12/12/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	69.1	B		P	K,W
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	2.5	U		P	
7440-39-3	Barium	132			P	
7440-41-7	Beryllium	0.10	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	82800			P	
7440-47-3	Chromium	0.95	B		P	
7440-48-4	Cobalt	2.1	B		P	
7440-50-8	Copper	1.4	U		P	
7439-89-6	Iron	674			P	
7439-92-1	Lead	3.4			P	K,W
7439-95-4	Magnesium	29900			P	
7439-96-5	Manganese	763			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	10.2			P	
7440-09-7	Potassium	1160			P	
7782-49-2	Selenium	3.3	U		P	
7440-22-4	Silver	0.70	U		P	SIL,P
7440-23-5	Sodium	4420			P	
7440-28-0	Thallium	5.1	U		P	
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	28.3			P	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SW846 METALS

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: X2810

SOW No.: SW846

EPA Sample No.	Lab Sample ID.
54DPW1	X2810-1
54DPW1D	WG22067-3
54DPW1S	WG22067-1
54DPW1SD	WG22067-2
54DPW2	X2810-2
54DPW3	X2810-3

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: THE FOLLOWING ANALYTES HAVE BEEN FLAGGED WITH AN "E" TO INDICATE SERIAL DILUTION RESULTS WHICH WERE OUTSIDE CONTROL LIMITS:
ZINC

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Mary K. Powell Name: Mary K. Powell

Date: December 23, 2002 Title: Data Reviewer II

SW846 METALS

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54DPW1

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: X2810

Matrix (soil/water): WATER Lab Sample ID: X2810-1

Level (low/med): LOW Date Received: 12/12/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	38.0	B		P	K,W
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	2.5	U	N	P	UL,M
7440-39-3	Barium	165			P	
7440-41-7	Beryllium	0.10	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	86400			P	
7440-47-3	Chromium	0.60	U		P	
7440-48-4	Cobalt	1.7	B		P	
7440-50-8	Copper	1.4	U		P	UL,W
7439-89-6	Iron	369			P	
7439-92-1	Lead	2.3	U		P	
7439-95-4	Magnesium	31100			P	
7439-96-5	Manganese	54.2			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	22.0			P	
7440-09-7	Potassium	1450			P	K,W
7782-49-2	Selenium	8.1			P	L,W
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	5190			P	
7440-28-0	Thallium	5.1	U	N	P	UL,M
7440-62-2	Vanadium	1.4	B		P	
7440-66-6	Zinc	79.6		E	P	J,S

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

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SW846 METALS

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54DPW2

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: X2810

Matrix (soil/water): WATER Lab Sample ID: X2810-2

Level (low/med): LOW Date Received: 12/12/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21.8	U		P	
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	2.5	U	N	P	UL,M
7440-39-3	Barium	154			P	
7440-41-7	Beryllium	0.10	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	75600			P	
7440-47-3	Chromium	1.1	B		P	
7440-48-4	Cobalt	2.1	B		P	
7440-50-8	Copper	1.4	U		P	UL,N
7439-89-6	Iron	24.3	B		P	
7439-92-1	Lead	2.3	U		P	
7439-95-4	Magnesium	28600			P	
7439-96-5	Manganese	47.5			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	3.0	B		P	
7440-09-7	Potassium	1390			P	E,N
7782-49-2	Selenium	7.1			P	L,N
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	8750			P	
7440-28-0	Thallium	5.1	U	N	P	UL,M
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	21.2		E	P	J,S

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

SW846 METALS
-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

54DPW3

Lab Name: COMPUCHEM Contract:

Lab Code: LIBRTY Case No.: SAS No.: SDG No.: X2810

Matrix (soil/water): WATER Lab Sample ID: X2810-3

Level (low/med): LOW Date Received: 12/12/02

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	21.8	U		P	
7440-36-0	Antimony	3.7	U		P	
7440-38-2	Arsenic	2.5	U	N	P	UL,M
7440-39-3	Barium	138			P	
7440-41-7	Beryllium	0.10	U		P	
7440-43-9	Cadmium	0.40	U		P	
7440-70-2	Calcium	88300			P	
7440-47-3	Chromium	0.60	U		P	
7440-48-4	Cobalt	1.9	B		P	
7440-50-8	Copper	1.4	U		P	UL,W
7439-89-6	Iron	649			P	
7439-92-1	Lead	2.3	U		P	
7439-95-4	Magnesium	31600			P	
7439-96-5	Manganese	778			P	
7439-97-6	Mercury	0.10	U		CV	
7440-02-0	Nickel	9.9			P	
7440-09-7	Potassium	1410			P	L,W
7782-49-2	Selenium	6.7			P	L,W
7440-22-4	Silver	0.70	U		P	
7440-23-5	Sodium	4600			P	
7440-28-0	Thallium	5.1	U	N	P	UL,M
7440-62-2	Vanadium	0.70	U		P	
7440-66-6	Zinc	27.1		E	P	J,S

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments: DISSOLVED

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DATA VALIDATION WORKSHEET

Explosives

Reviewer: JA
Date: 3/5/03
DV Level: II (III) IV
Review Document:

_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: W2810
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	✓	✓	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		

Notes:

Cooler temp 3.8°C

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	✓		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	✓		
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		✓	

Notes:

Date Collected	Date Extracted	H.T.	Date Analyzed.	H.T.
12/11/02	12/13/02	2 days	12/29/02	16 days
			1/3/02	21 days

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			✓

Notes: PBLKCY 2,4,6-Trinitrotoluene 0.5J ug/L → 54PPW2 B,x
PBLKAA All NDs.

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	✓		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	✓	✓	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			✓
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).		✓	
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	✓		

Notes: I. Cal 12/27/02 (VARIAN74). All %RSDs or r^2 were in control on both columns
C. Cal. see attached.

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	✓		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?		✓	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		✓	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.		✓	
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes: 54PPW2 1,4-dinitrobenzene 14%/30% (39-132%) L/UL.

⊗ Surrogate retention time was shifted

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS/MSD – 544PW2. 2,4,6-Trinitrotoluene MS = 36%, MSD = 42%. (SV-150R)
2-nitrotoluene RPD = 40% (30%)

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present? only LCS	✓		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?	✓		
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits? only LCS			✓
	Action: If Yes, J(+) only.			

Notes: PLCSCY (12/13/02 extracted). All LCS %Rs were ~~in control~~ less than LCL.
PLCSAA (12/18/02 extracted) All %Rs were in control.
→ MS/MSD

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?			✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			✓

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		✓	
10.1.1	Number of samples: 3 x 14 = 42			
10.1.3	Number of results rejected and not reported: ~~14~~ 40			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 4.8%			
	% Completeness = 4.8%.			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: AJ
Date: 02/06/05
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Compuchem
SDG No.: W2810
Test Name: Nitroglycerin
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: cooler temp 8.3°C

sampled 12/11/02
extracted 12/13/02
analysis 01/06/03

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits? 54% 150%	X		
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS/MSD 5408 W2
MS %R = 38% MSD %R = 55% RPD = 10%

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits? 54%		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes: No LCSD

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?		X	
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.			X

Notes:
No field duplicates in this batch.

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓	X	
10.1.1	Number of samples: 3		(JA)	
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = ~~total~~ 100% (JA)			
	% Completeness = ~~total~~ 100% (JA)			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

Project Name: Radford SWMU 54
Reviewer: JA
Date: 3/5/03

SDG No.: W2810
Project No.: 15291524.00000

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{O}C \pm 2\ ^{O}C$)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes, % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note: Cooler temp 3.8°c.

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note:

	Date Collected	Date Analyzed	H.T.
ICP	12/11/02	12/19/02	8 days
Hg	12/11/02	12/19/02	8 days

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%?		✓				
	<50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						

Note:

CRDL

Al	111.1%.	K(+)	K, UJ
Pb	137.7%	↓	K, UJ
Se	114.0%	↓	K, UJ
Na	78.0%	L/UL	All results > 2x CRDL
Tl	113.4%.	K(+).	All NDs
Hg	120% / OK.		No limits.

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B					✓	
4.4	Are there negative blank results with the absolute value > MDL?	✓				✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L			✓			✓
4.5	Are there reported field blankor trip blank values > ± MDL?						
	Sample Results > MDL						
	< 5X Blank Contamination B						

Note: See attached.

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?		✓				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓					
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ( ) for the analyte with results that fall outside criteria.	✓			✓		

Note: Lab dup: 574PW1 All %RPDs were in control

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?	✓			✓		
	%R > 125% / 30%< %R < 74% / < 30%						
	Positive: K / L / L						
	Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.			✓			✓

Note: MS/MSD - 544DPW1 All %Rs were in control
- No post-digestion spike - not needed.

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).	✓					

Note: ICP Serial dilution. All %Ds were in control.

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓			✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report			✓			✓

Note: _____

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?			✓			✓
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note: _____

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples: 3						
13.1.2	Number of target compounds in each analysis: _____						
13.1.3	Number of results rejected and not reported: 0						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%						

Note: _____

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: X2810
Project No.: 15291524.00000

Project Name: Radford SWMU 54
Reviewer: JA
Date: 3/5/03

1.0 Chain of Custody/Sample Condition/Raw Data

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{O}C \pm 2\ ^{O}C$)	✓			✓		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓		

Note: Cooler temp 3.8°C

2.0 Holding Time

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) Action: L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓	

Note:

	Date Collected	Date Analyzed	H.T.
Lep	12/11/02	12/18/02	7 days
Hg	12/11/02	12/20/02	9 days

3.0 Instrument Calibration

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve with a low point at RL? (ICP: blank + one standard; CVAA: blank + five standards). If not, qualify with "R".				✓		
3.2	Are the correlation coefficients > 0.995? (for CVAA) Action: J(+)/UJ(-).				✓		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓		
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR Hg ICV 90%-110% and CCV 80-120%; FOR ICP ICV &CCV 90%-110%.	✓			✓		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury ICV < 65% 65% - 90% > 110% Mercury CCV < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%						
3.6	For ICP, did the CRDL standard recover between 90-110%?		✓				
	<50% 50%-89% >110% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						

Note:

CRDL

Al	112.0%	K(+)	F, W	Hg r = 0.999994
Cd	116.0%	K(+)	All ND, UL	
Cu	67.0%	L/UL	UL, W	
K	117.3%	K(+).	F, W	
Fe	66.0%	L/UL	I, W	
Na	79.8%	L/UL	result > 2xCRDL, UL	

4.0 Blanks

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓		
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓				✓	
	Sample Results > MDL						
	< 5X Blank Contamination B		✓			✓	
4.4	Are there negative blank results with the absolute value > MDL?		✓			✓	
	Sample Results Non-detects > MDL						
	< 5X absolute Blank Contamination UL L			✓			✓
4.5	Are there reported field blankor trip blank values > ± MDL?						
	Sample Results > MDL						
	< 5X Blank Contamination B						

Note: See attached

5.0 ICP Interference Check Sample (ICS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning and end of each ICP run (or at least twice every 8 hours)?	✓					
5.2	Are the ICS AB recoveries within 80% - 120%?	✓					
5.3	Are the results for unspiked analytes (in ICS A) < ± IDL?		✓				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	✓					
	If not...						
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)						

Note:

6.0 Laboratory Control Sample (LCS)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)						

Note:

7.0 Laboratory Duplicates

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
7.3	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	✓			✓		

Note: Lab dup - 570PW1 All RPDs were in control

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		✓		✓		
	%R > 125% / 30%< %R < 74% / < 30%: Positive: K / L / L; Non-detect: None / UL / R						
8.4	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.		✓				✓

Note: MS/MSD - 540PW1 As MS = 52.2%, MSD = 52.3% L/UL
Tl MS = 69.5%, MSD = 74.7% L/UL
* Post-digestion spike analysis was not performed by the lab

9.0 Instrument Detection Limits (IDL)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓			✓		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓					
10.2	Was a five-fold dilution performed?	✓					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 50 X the IDL in the original sample? If no, J(+).		✓				

Note: Serial Dilution - 540PW1
Zn = 10.5% J

11.0 Field Duplicate Samples

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			✓			✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.						
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report			✓			✓

Note: _____

12.0 Result Verification

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?			✓			✓
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓		

Note: _____

13.0 Completeness Calculation

		ICP			CVAA-Hg		
		Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓		
13.1.1	Number of samples: 3						
13.1.2	Number of target compounds in each analysis: 22						
13.1.3	Number of results rejected and not reported: 0						
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)						
	% Completeness = 100%						

Note: _____

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1086

Project Number	Project Name
C96.04-510	RFAAP

Project Contact (Name and Phone Number): Darren Renne

Samplers: Fisher / Spangler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54DPW1	12/11/02 1020	5		X	2	B	F	4						X		X							Metals Filtered and
54DPW2	12/11/02 1330	5		X	2	B	F	4						X		X							unfiltered
54DPW3	12/11/02 900	5		X	2	B	F	4						X		X							

Box #1 (Matrix Type): 1. Surface Water; 2. Ground Water; 3. Leachate; 4. Rinsate; 5. Soil Sediment/Sludge; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other _____

Box #2 (Preservative): A. HCl + Ice; B. HNO3 + Ice; C. NaOH + Ice; D. H2SO4 + Ice; E. Unpreserved; F. Ice Only; G. Other _____; H. NaHSO4 + Ice; I. ZnAc + NaOH + Ice

Box #3: F. Filtered; U. Unfiltered

Box #4 (Turnaround Time): R. Rush - 3 Day; S. Standard 28 Day; T. Timely 14 Day; O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature] 12/11/02	1700				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 12-12-02	900	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: H2L120252 **Fraction:** Perchlorate

Lab: STL-Knoxville **Project Name:** Radford_SWMU_54

Reviewer: Andrea_Sansom **Date:** March 3, 2003

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The continuing calibration blanks displayed estimate concentrations of perchlorate at 0.294 ug/L and 0.417 ug/L. The analyst has performed manual integrations that eliminate extraneous baseline from the integrated area that determine sample concentrations but did not perform manual integrations for the continuing calibration blanks. Using professional judgment, the associated field sample result that was slightly less than five times the blank concentration, 54DPW3 at 2.0 ug/L, was not qualified.

Correctable Anomalies: None.

Comments: None.

Signed: Andrea Sansom

URS

Client Sample ID: 54DPW1

General Chemistry

Lot-Sample #...: H2L120252-001 Work Order #...: FEPMG Matrix.....: WG
Date Sampled...: 12/11/02 Date Received..: 12/12/02

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	5.5	1.0	ug/L	KNOX 314.0 MOD	12/17-12/18/02	2352395

Dilution Factor: 1

URS

Client Sample ID: 54DPW2

General Chemistry

Lot-Sample #...: H2L120252-002 Work Order #...: FEPMK Matrix.....: WG
Date Sampled...: 12/11/02 Date Received..: 12/12/02

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	27.7	1.0	ug/L	KNOX 314.0 MOD	12/17-12/18/02	2352395

Dilution Factor: 1

URS

Client Sample ID: 54DPW3

General Chemistry

Lot-Sample #...: H2L120252-003 Work Order #...: FEPML Matrix.....: WG
Date Sampled...: 12/11/02 Date Received..: 12/12/02

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	2.0	1.0	ug/L	KNOX 314.0 MOD	12/17-12/18/02	2352395

Dilution Factor: 1

DATA ASSESSMENT WORKSHEET

Perchlorate

Reviewer: AS
Date: 3/3/03
DV Level: II III IV (circle 1)
Review Document:

EPA method - Modified for USEPA Region III Modifications to NFGs (Inorganic)

Project Name: Radford SWMU 40/71
Project Number: 15295137.10000
Laboratory: STL-Knoxville
SDG No.: H2L120252
Test Name: Perchlorate
Method No.: E314.0

1.0 Laboratory Deliverables		Yes	No	NA
1.1a	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.1b	Do sample ID Numbers on COC match those in report?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes, % solids	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		
	Action: Resolve any discrepancies before proceding further.			

Notes:

54DPW1 FEPM6 H2L120252
54DPW2 FEPMK
54DPW3 FEPML

2.0 Holding Times and Preservation		Yes	No	NA
2.1	Do sample collection, preservation, shipping, and storage condition meet the requirement of the relevant Project Controlling Documents (PCDs)?	✓		
	Action: No chemical preservation required.			
2.2	Have technical holding times (28 days), determined from date of sampling to date of analysis (including dilution or reanalysis) been exceeded? If yes, apply J(+)/UJ(-) to all associated analytes.		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, apply J(+)/R(-) to all associated analytes.		✓	

Notes: GW sampled 12/11/02 prepped 12/17
pH 7 analyzed 12/18 /

Cooler 3°C

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were required blanks (MB) prepared/submitted at the appropriate frequency? If not, note in DV report.	✓		
3.2	Do any method blanks have positive results above the MDL? Action: If Yes, positive associated sample results less than 5X the concentration in the blank should be qualified "B" indicating the result is qualitatively suspect.		✓	
3.3	After correcting for method blank contamination, do any field/equipment/trip blanks have positive results? If so, apply the same rules given above based on the highest blank value of those associated with the sample.			✓

Notes:

MB - ND open CCB 0.294 ppb
closing CCB 0.417 ppb - baseline N/A

4.0 Initial and Continuing Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.2	Are all initial calibration correlation coefficients within the control limits (i.e., r > 0.99)? If No, apply "R" to all non-detects; "J" to positive results for all samples associated with the calibration.	✓		
4.3	Was a instrument performance check (IPC) analyzed at the matrix conductivity threshold (MCT)? If no, verify that the sample chromatagrams do not display this interference.	✓		
4.4	Is the Pd_{MH} < 25%, % recovery between 80-120%, and the retention time shift < 5%. If No, apply R to all results for sample that display this type of interference.	✓		
4.5	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Control limit: ≤ ± 15%. If No, apply "R" to all non-detects; "J*" to positive results for all samples associated with the calibration. Positive results are to be used only qualitatively.	✓		

Notes:

4 - 400 ppb MCT - 7.12% D
2 1st order
r = 0.9986 CCC 192.432/200

ICV 0.67% D
(2° Source)

10.67
10.64
10.64
10.70
10.63
10.59

5.0 Matrix Spikes

		Yes	No	NA
5.1	Was a matrix spike analyzed at required frequency per the PCDs?			✓
5.2	Is the %R for the matrix spike and matrix spike duplicate outside the QC limits?			✓
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

6.0 Laboratory Control Samples (LCS/LCSDs)

		Yes	No	NA
6.1	Were LCS analyzed at required frequency per the PCDs?	✓		
6.2	Are there any LCS and/or LCSD recoveries outside the QC limits (i.e., 85-115%)?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
6.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits (i.e., 15%)?			✓
	Action: If Yes, J(+) only.			

Notes:

LCS 87%

7.0 Field Duplicates

		Yes	No	NA
7.1	Was a field duplicate submitted/analyzed at an appropriate frequency of one per ten?			✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			✓

Notes:

8.0 Laboratory Duplicates (sample duplicate or matrix spike duplicate)		Yes	No	NA
8.1	Was a duplicate analyzed at the correct frequency?			✓
8.2	Are all analyte duplicate results within control limits? If No, J(+) only. Note in DV report any instance where one or another of the pair was positive while the other was negative.			✓

Notes:

External MS/MSD ✓

9.0 Analyte Identification and Detection Limit Verification		Yes	No	NA
9.1	Do retention times in calibrations and samples fall within appropriately developed and applied windows? If not, look for uniform shifts. Failing that, flag all results "R" as qualitatively suspect.	✓		
9.2	Verify quantitative results. Do manual calculations agree with reported values to within rounding error? If not, increase audit. If additional errors are found, require resubmission. Notify PM immediately.	✓		
9.3	Do detection/reporting limits meet those required by the QAPP and were they properly adjusted for dilution factors and dry weight equivalent of wet weight aliquot)? If not, note affected sample Ids in DV report.	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit: 90%)	✓		
10.1.1	Number of samples: _____			
10.1.2	Number of target compounds in each analysis: _____			
10.1.3	Number of results rejected and not reported: _____			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = _____			

Notes:

1721202S2

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1087

Project Number	Project Name
09604310	RFAAP

Project Contact (Name and Phone Number): Doreen Rennie

Samplers: Fisher / Spangler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54DPW1	12/11/02 1020	5		X	2	B	F	2									X	pH 7					Metals Filtered and
54DPW2	12/11/02 1350	5		X	2	B	F	2									X						Unfiltered
54DPW3	12/11/02 900	5		X	2	B	F	2									X	↓					
																							3°C
																							Custody Seals intact
																							FedEx #
																							832742535911
																							EBS. 12/12/02

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature] 12/11/02	1800	[signature]			
Relinquished by:	Date/time	Received by: (for lab) 12/13/02 0845	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: H3C040115 **Fraction:** Perchlorate

Lab: STL/Knoxville **Project Name:** Radford SMWU 54

Reviewer: GF **Date:** April 15, 2003

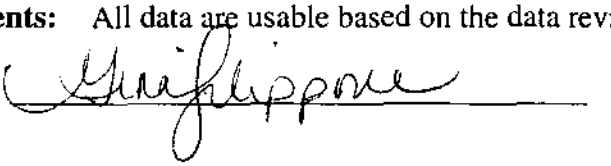
This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the *National Functional Guidelines for Inorganic Data Review* as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: All data are usable based on the data reviewed.

Signed: 

SAMPLE SUMMARY

H3C040115

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
FJH0V	001	54MW6	03/03/03	15:05
FJH00	002	GW/EB-1	03/03/03	15:30

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

URS

Client Sample ID: 54MW6

General Chemistry

Lot-Sample #...: H3C040115-001 Work Order #...: FJH0V Matrix.....: WG
Date Sampled...: 03/03/03 Date Received..: 03/04/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	KNOX 314.0 MOD	03/17-03/20/03	3079329

Dilution Factor: 1

URS

Client Sample ID: GW/EB-1

General Chemistry

Lot-Sample #...: H3C040115-002 **Work Order #...:** FJH00 **Matrix.....:** WG
Date Sampled...: 03/03/03 **Date Received..:** 03/04/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	KNOX 314.0 MOD	03/17-03/20/03	3079329

Dilution Factor: 1

DATA ASSESSMENT WORKSHEET

Reviewer: GF
Date: 4/14/2003
DV Level: II III IV (circle 1)
Review Document:

Perchlorate

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: STL-Knoxville
SDG No.: H3C040115
Test Name: Perchlorate
Method No.: E314.0

EPA method - Modified for USEPA Region III Modifications to NFGs (Inorganic)

1.0 Laboratory Deliverables		Yes	No	NA
1.1a	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.1b	Do sample ID Numbers on COC match those in report?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % sol	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		
	Action: Resolve any discrepancies before proceding further.			

Notes:

2.0 Holding Times and Preservation		Yes	No	NA
2.1	Do sample collection, preservation, shipping, and storage condition meet the requirement of the relevant Project Controlling Documents (PCDs)?	✓		
	Action: No chemical preservation required.			
2.2	Have technical holding times (28 days), determined from date of sampling to date of analysis (including dilution or reanalysis) been exceeded? If yes, apply J(+)/UJ(-) to all associated analytes.		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, apply J(+)/R(-) to all associated analytes.		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were required blanks (MB) prepared/submitted at the appropriate frequency? If not, note in DV report.	✓		
3.2	Do any method blanks have positive results above the MDL? Action: If Yes, positive associated sample results less than 5X the concentration in the blank should be qualified "B" indicating the result is qualitatively suspect.		✓	
3.3	After correcting for method blank contamination, do any field/equipment/trip blanks have positive results? If so, apply the same rules given above based on the highest blank value of those associated with the sample.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.2	Are all initial calibration correlation coefficients within the control limits (i.e., r > 0.99)? If No, apply "R" to all non-detects; "J" to positive results for all samples associated with the calibration.	✓		
4.3	Was a instrument performance check (IPC) analyzed at the matrix conductivity threshold (MCT)? If no, verify that the sample chromatagrams do not display this interference.	✓		
4.4	Is the $Pd_{A/H}$ < 25%, % recovery between 80-120%, and the retention time shift < 5%. If No, apply R to all results for sample that display this type of interference.	✓		
4.5	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Control limit: ≤ ± 15%. If No, apply "R" to all non-detects; "J*" to positive results for all samples associated with the calibration. Positive results are to be used only qualitatively.	✓		

Notes:

5.0 Matrix Spikes		Yes	No	NA
5.1	Was a matrix spike analyzed at required frequency per the PCDs?	✓		
5.2	Is the %R for the matrix spike and matrix spike duplicate outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

6.0 Laboratory Control Samples (LCS/LCSDs)		Yes	No	NA
6.1	Were LCS analyzed at required frequency per the PCDs?	✓		
6.2	Are there any LCS and/or LCSD recoveries outside the QC limits (i.e., 85-115%)?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
6.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits (i.e., 15%)?		✓	
	Action: If Yes, J(+) only.			

Notes:

7.0 Field Duplicates		Yes	No	NA
7.1	Was a field duplicate submitted/analyzed at an appropriate frequency of one per ten?	✓		✓
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		✓

Notes:

8.0 Laboratory Duplicates (sample duplicate or matrix spike duplicate)		Yes	No	NA
8.1	Was a duplicate analyzed at the correct frequency?	✓		
8.2	Are all analyte duplicate results within control limits? If No, J(+) only. Note in DV report any instance where one or another of the pair was positive while the other was negative.	✓		

Notes:

9.0 Analyte Identification and Detection Limit Verification		Yes	No	NA
9.1	Do retention times in calibrations and samples fall within appropriately developed and applied windows? If not, look for uniform shifts. Failing that, flag all results "R" as qualitatively suspect.	✓		
9.2	Verify quantitative results. Do manual calculations agree with reported values to within rounding error? If not, increase audit. If additional errors are found, require resubmission. Notify PM immediately.			Level IIB
9.3	Do detection/reporting limits meet those required by the QAPP and were they properly adjusted for dilution factors and dry weight equivalent of wet weight aliquot)? If not, note affected sample Ids in DV report.	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit: 90%)	✓		
10.1.1	Number of samples: 2			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

PROJECT NARRATIVE
H3C040115
Revised

This report has been revised to include the appropriate title page.

The results reported herein are applicable to the samples submitted for analysis only.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation was included with the original report.

Sample Receipt

There were no problems with the condition of samples received.

Quality Control

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

STL Knoxville maintains the following certifications, approvals and accreditations: Arkansas DEQ, California DHS ELAP Cert. #2423, Connecticut DPH Cert. #PH-0223, Florida DOH Cert. #E87177, Georgia DNR Cert. #906 (SDWA, 5/14/01-6/21/02), Hawaii DOH, Illinois EPA Cert. #000510, Indiana DOH Cert. #C-TN-02, Kentucky DEP Lab ID #90101, Louisiana DEQ Cert. #03079, Maryland DHMH Cert. #277, Massachusetts DEP Cert. #M-TN009, Michigan DEQ Lab ID #9933, New Jersey DEP Cert. #TN001, New York DOH Lab #10781, North Carolina DPH Lab ID #21705, North Carolina DEHNR Cert. #64, Oklahoma DEQ ID #9415, Pennsylvania DEP Cert. #68-576, South Carolina DHEC Lab ID #84001, Tennessee DOH Lab ID #02014, Virginia DGS Lab ID #00165, Washington DOE Lab #C120, Wisconsin DNR Lab ID #998044300, US Army Corps of Engineers, Naval Facilities Engineering Service Center, US EPA Perchlorate Approval and USDA Soil Permit #S-46424. This list of approvals is subject to change and does not imply that laboratory certification is available for all parameters reported in this environmental sample data report.

H3C040115

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1059

Project Number	Project Name
096045D	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fidler / Copen

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW6	3/3/03 1505	5		X	2	E	U	1									X						High Concentrations
GW/EB-1	3/3/03 1530	5		X	2	E	U	1									X						not expected
																							3°C temp
																							Custody Seals intact
																							Fed Ex #
																							832942538855
																							BS 2/4/03
																							S/4/03 RES

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
Bill Fidler	3/3/03 1800				
Relinquished by:	Date/Time	Received by: (for lab) Big Bshaw	Date/Time 3/4/03 09:00	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: H3C050120 **Fraction:** Perchlorate

Lab: STL/Knoxville **Project Name:** Radford SMWU 54

Reviewer: GF **Date:** April 15, 2003

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the *National Functional Guidelines for Inorganic Data Review* as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: All data are usable based on the data reviewed.

Signed: Gregory Hoppe

SAMPLE SUMMARY

H3C050120

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
FJK4R	001	54MW5	03/04/03	08:50
FJK4V	002	54MW7	03/04/03	08:50
FJK4X	003	GW/DUP-1	03/04/03	
FJK41	004	54MW4	03/04/03	12:30
FJK42	005	54MW3	03/04/03	13:55
FJK44	006	54MW2	03/04/03	15:10
FJK45	007	GW/EB-2	03/04/03	15:30

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

URS

Client Sample ID: 54MW5

General Chemistry

Lot-Sample #...: H3C050120-001 Work Order #...: FJK4R Matrix.....: WG
Date Sampled...: 03/04/03 Date Received..: 03/05/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	1.6	1.0	ug/L	KNOX 314.0 MOD	03/17-03/20/03	3079329

Dilution Factor: 1

URS

Client Sample ID: 54MW7

General Chemistry

Lot-Sample #...: H3C050120-002 Work Order #...: FJK4V Matrix.....: WG
Date Sampled...: 03/04/03 Date Received..: 03/05/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	KNOX 314.0 MOD	03/17-03/20/03	3079329

Dilution Factor: 1

URS

Client Sample ID: GW/DUP-1

General Chemistry

Lot-Sample #...: H3C050120-003 Work Order #...: FJK4X Matrix.....: WG
Date Sampled...: 03/04/03 Date Received..: 03/05/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	KNOX 314.0 MOD	03/17-03/20/03	3079329

Dilution Factor: 1

URS

Client Sample ID: 54MW4

General Chemistry

Lot-Sample #...: H3C050120-004 Work Order #...: FJK41 Matrix.....: WG
Date Sampled...: 03/04/03 Date Received..: 03/05/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	KNOX 314.0 MOD	03/17-03/20/03	3079329

Dilution Factor: 1

URS

Client Sample ID: 54MW3

General Chemistry

Lot-Sample #...: H3C050120-005 Work Order #...: FJK42 Matrix.....: WG
Date Sampled...: 03/04/03 Date Received..: 03/05/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	59.2	1.0	ug/L	KNOX 314.0 MOD	03/07/03	3069389

Dilution Factor: 1

URS

Client Sample ID: 54MW2

General Chemistry

Lot-Sample #...: H3C050120-006 Work Order #...: FJK44 Matrix.....: WG
Date Sampled...: 03/04/03 Date Received..: 03/05/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	12.0	1.0	ug/L	KNOX 314.0 MOD	03/07/03	3069389

Dilution Factor: 1

URS

Client Sample ID: GW/EB-2

General Chemistry

Lot-Sample #...: H3C050120-007 **Work Order #...:** FJK45 **Matrix.....:** WG
Date Sampled...: 03/04/03 **Date Received..:** 03/05/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	KNOX 314.0 MOD	03/17-03/20/03	3079329

Dilution Factor: 1

DATA ASSESSMENT WORKSHEET

Reviewer: GF
Date: 4/14/2003
DV Level: II III IV (circle 1)
Review Document:

Perchlorate

EPA method - Modified for USEPA Region III Modifications to NFGs (Inorganic)

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: STL-Knoxville
SDG No.: H3C050120
Test Name: Perchlorate
Method No.: E314.0

1.0 Laboratory Deliverables		Yes	No	NA
1.1a	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.1b	Do sample ID Numbers on COC match those in report?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % sol	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	✓		
	Action: Resolve any discrepancies before proceding further.			

Notes:

2.0 Holding Times and Preservation		Yes	No	NA
2.1	Do sample collection, preservation, shipping, and storage condition meet the requirement of the relevant Project Controlling Documents (PCDs)?	✓		
	Action: No chemical preservation required.			
2.2	Have technical holding times (28 days), determined from date of sampling to date of analysis (including dilution or reanalysis) been exceeded? If yes, apply J(+)/UJ(-) to all associated analytes.		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, apply J(+)/R(-) to all associated analytes.		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were required blanks (MB) prepared/submitted at the appropriate frequency? If not, note in DV report.	✓		
3.2	Do any method blanks have positive results above the MDL? Action: If Yes, positive associated sample results less than 5X the concentration in the blank should be qualified "B" indicating the result is qualitatively suspect.		✓	
3.3	After correcting for method blank contamination, do any field/equipment/trip blanks have positive results? If so, apply the same rules given above based on the highest blank value of those associated with the sample.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	✓		
4.2	Are all initial calibration correlation coefficients within the control limits (i.e., r > 0.99)? If No, apply "R" to all non-detects; "J" to positive results for all samples associated with the calibration.	✓		
4.3	Was a instrument performance check (IPC) analyzed at the matrix conductivity threshold (MCT)? If no, verify that the sample chromatagrams do not display this interference.	✓		
4.4	Is the $Pd_{A/H}$ < 25%, % recovery between 80-120%, and the retention time shift < 5%. If No, apply R to all results for sample that display this type of interference.	✓		
4.5	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Control limit: ≤ ± 15%. If No, apply "R" to all non-detects; "J*" to positive results for all samples associated with the calibration. Positive results are to be used only qualitatively.	✓		

Notes:

5.0 Matrix Spikes		Yes	No	NA
5.1	Was a matrix spike analyzed at required frequency per the PCDs?	✓		
5.2	Is the %R for the matrix spike and matrix spike duplicate outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

6.0 Laboratory Control Samples (LCS/LCSDs)		Yes	No	NA
6.1	Were LCS analyzed at required frequency per the PCDs?	✓		
6.2	Are there any LCS and/or LCSD recoveries outside the QC limits (i.e., 85-115%)?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
6.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits (i.e., 15%)?		✓	
	Action: If Yes, J(+) only.			

Notes:

7.0 Field Duplicates		Yes	No	NA
7.1	Was a field duplicate submitted/analyzed at an appropriate frequency of one per ten?	✓		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 54MW7 and GW1Dup1
ND ND

8.0 Laboratory Duplicates (sample duplicate or matrix spike duplicate)		Yes	No	NA
8.1	Was a duplicate analyzed at the correct frequency?	✓		
8.2	Are all analyte duplicate results within control limits? If No, J(+) only. Note in DV report any instance where one or another of the pair was positive while the other was negative.	✓		

Notes:

9.0 Analyte Identification and Detection Limit Verification		Yes	No	NA
9.1	Do retention times in calibrations and samples fall within appropriately developed and applied windows? If not, look for uniform shifts. Failing that, flag all results "R" as qualitatively suspect.	✓		
9.2	Verify quantitative results. Do manual calculations agree with reported values to within rounding error? If not, increase audit. If additional errors are found, require resubmission. Notify PM immediately.	✓		lab
9.3	Do detection/reporting limits meet those required by the QAPP and were they properly adjusted for dilution factors and dry weight equivalent of wet weight aliquot)? If not, note affected sample Ids in DV report.	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit: 90%)	✓		
10.1.1	Number of samples: 7			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: Ø			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

PROJECT NARRATIVE
H3C050120
Revised

This report has been revised to include the appropriate title page.

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The original chain of custody documentation was included with the original report.

Sample Receipt

There were no problems with the condition of samples received.

Quality Control

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

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H3C050120

Radford Army Ammunition Plant

Chain Of Custody Record

Nº 1053

Project Number	Project Name
09604310	RFAAP

Project Contact (Name and Phone Number): Todd LaMaskin

Samplers: Fisher / Copen

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW5	3/4/03 750	5		X	2	E	U	1									X						[redacted] Confirmation
54MW5 MS	3/4/03 750	5		X	2	E	U	1									X						[redacted] 2x per day
54MW5 MSD	3/4/03 750	5		X	2	E	U	1									X						
54MW7	3/4/03 1030	5		X	2	E	U	1									X						
GW/Dup-1	3/4/03 —	5		X	2	E	U	1									X						
54MW4	3/4/03 1230	5		X	2	E	U	1									X						
54MW3	3/4/03 1355	5		X	2	E	U	1									X						2°C temp
54MW12	3/4/03 1510	5		X	2	E	U	1									X						Custody Seals intact
GW/EB-2	3/4/03 1530	5		X	2	E	U	1									X						Fed Ex #
																							8329 4253 9962
																							ABS 3/5/03

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	3/4/03 (1700)				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 3/5/03 09:00	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 59077_(Revision 1) **Fraction:** Dioxin/Furan

Lab: Triangle **Project Name:** Radford SWMU_54

Reviewer: Andrea_Sansom **Date:** April 17, 2003

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: Sample 54SB25B displayed a positive detection for 2,3,7,8-TCDF that was not reported from the alternate column DB225. This result was flagged "R,p".

Minor Anomalies: The closing continuing calibration analyzed on 12/12/02 at 1010 displayed an internal standard %D greater than the control limit (i.e., 30%) with a negative bias for $^{13}C_{12}$-OCDD at 34.2%. The associated positive field sample results were flagged "J,c".

The laboratory flag "X" indicates that the associated PCDF peak/s has the same retention time as diphenyl ether and that the diphenyl ether contribution to the total PCDF value is greater than ten percent. All PCDF results influenced by this co-elution have been reported as estimate maximum possible concentrations (EMPCs) and were flagged "J,w".

Correctable Anomalies: None.

Comments: The positive 2,3,7,8-TCDF detection for samples 54SB32A, 54SB32B, and 54SB33A on the DB-5 column were re-analyzed on a DB-225 column that is more suitable for the determination of this congener. The DB-225 result for this congener should be used for data interpretation. This concentration has been appropriately used to determine the toxicity equivalent factor.

The laboratory flag "J" represents a reported concentration that was less than the linear range of the initial calibration and an estimate sample result.

Signed: Andrea Sansom

TRIANGLE LABORATORIES, INC.
Transfer Chain-of-Custody Form
Project 59077

Transfer From: DWLH5 To: DMS5

	Initials..	Date.....	Time...
Released by:	[illegible]	12/4/02	14:30
Accepted by:	[illegible]	12/11/02	15:00

MILES.ID.....		TLI_No.....	Cust.Id.....
59077-	-001	TLI Blank	TLI Blank
59077-	-002	342-70-1	54SB25A
59077-	-003	342-70-2	54SB25B
59077-	-004	342-70-3	54SB30A
59077-	-005	342-70-4	54SB30B
59077-	-006	342-70-5	54SB32A
59077-	-007	342-70-6	54SB32B
59077-	-008	342-70-7	54SB33A
59077-	-009	342-70-8	54SB33B
59077-	-010	342-70-9 MS	54SB33BMS (MS)
59077-	-011	342-70-10MSD	54SB33BMSD(MSD)
59077-	-012	TLI LCS	TLI LCS
59077-	-013	TLI LCSD	TLI LCSD

XfrCOC (Rev 11/01/94)

Additional comments or instructions:

URS Group, Inc.

TLI Project: **59094r1** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB46A** — Analysis File: **W208707**

Client Project:	RFAAP/09604-310			ICal:	WF56142
Sample Matrix:	SOIL	Date Received:	12/07/2002	Spike File:	SPMIT322
TLI ID:	342-92-1	Date Extracted:	12/17/2002	1st CCal:	W022085
		Date Analyzed:	12/21/2002	End CCal:	W208713
Sample Size:	11.960 g	Dilution Factor:	n/a	% Moisture:	16.3
Dry Weight:	10.011 g	Blank File:	W208701	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JWL	% Solids:	83.7

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	5.9			0.75	27:27	
1,2,3,7,8-PeCDD	34.5	J,c		1.60	31:35	
1,2,3,4,7,8-HxCDD	62.7			1.21	34:41	
1,2,3,6,7,8-HxCDD	154			1.22	34:46	
1,2,3,7,8,9-HxCDD	163			1.22	35:06	
~~1,2,3,4,6,7,8-HpCDD~~	~~3550~~	J,c		1.02	38:07	E
~~1,2,3,4,6,7,8,9-OCDD~~	~~20860~~	J,c		0.86	41:53	E
~~2,3,7,8-TCDF~~	~~74.1~~			0.73	26:46	
1,2,3,7,8-PeCDF	ND	0.4				
2,3,4,7,8-PeCDF	29.6			1.48	31:15	
1,2,3,4,7,8-HxCDF	116			1.25	33:59	
1,2,3,6,7,8-HxCDF	57.0			1.28	34:05	
2,3,4,6,7,8-HxCDF	57.0			1.30	34:34	
1,2,3,7,8,9-HxCDF	3.3			1.20	35:23	J
1,2,3,4,6,7,8-HpCDF	1030			1.04	37:03	
1,2,3,4,7,8,9-HpCDF	54.9			1.04	38:39	
1,2,3,4,6,7,8,9-OCDF	2060	J,c		0.88	42:07	

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	66.1	9		86.4	
Total PeCDD	110 J,c	5		170 J,c	
Total HxCDD	1090	7			
~~Total HpCDD~~	~~6010~~	2			E
Total TCDF	447	10		1130 J,c	X
Total PeCDF	559	11		1400 J,c	X
Total HxCDF	1100	10		2670 J,c	X
Total HpCDF	2800	3		3220 J,c	X

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TLI Project: **59094r1** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **54SB46A** Analysis File: **P024662**

Client Project:	**RFAAP/09604-310**				
Sample Matrix:	**SOIL**	Date Received:	**12/07/2002**	Spike File:	**SPC2NF22**
TLI ID:	342-92-1	Date Extracted:	**12/17/2002**	ICal:	**PF56152**
		Date Analyzed:	**12/22/2002**	ConCal:	**P024658**
Sample Size:	**11.960 g**	Dilution Factor:	**n/a**	% Moisture:	**16.3**
Dry Weight:	**10.011 g**	Blank File:	**W208701**	% Lipid:	**n/a**
GC Column:	**DB-225**	Analyst:	**JLD**	% Solids:	**83.7**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	43.0			0.71	22:38	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	128	64.0	40%-130%	0.78	22:37	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.83	21:30	___

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TLI Project: **59094r1** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB46A** Analysis File: **T026654**

Client Project:	RFAAP/09604-310				
Sample Matrix:	SOIL	Date Received:	12/07/2002	Spike File:	SPMIT310
TLI ID:	342-92-1	Date Extracted:	12/17/2002	ICal:	TF5D202
		Date Analyzed:	12/26/2002	ConCal:	T026651
Sample Size:	11.960 g	Dilution Factor:	10	% Moisture:	16.3
Dry Weight:	10.011 g	Blank File:	W208701	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JLD	% Solids:	83.7

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
1,2,3,4,6,7,8-HpCDD	3090			1.04	37:39	___
1,2,3,4,6,7,8,9-OCDD	17790			0.84	41:20	___

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total HpCDD	5340	2			___

Internal Standards	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	2090	95.1	40%-135%	1.01	37:38	___
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	4820	110	40%-135%	0.85	41:19	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.20	34:40	___

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TLI Project: **59094r1** — Toxicity Equivalents Report
Client Sample: **54SB46A** — Analysis File: **W208707**

Client Project:	RFAAP/09604-310			ICal:	WF56142
Sample Matrix:	SOIL	Date Received:	12/07/02	Spike File:	SPMIT322
TLI ID:	342-92-1	Date Extracted:	12/17/02	1st CCal:	W022085
		Date Analyzed:	12/21/02	End CCal:	W208713
Sample Size:	11.960 g	Dilution Factor:	1	% Moisture:	16.3
Dry Weight:	10.011 g	Blank File:	W208701	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JWL	% Solids:	83.7

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	5.9	x	1.	=	5.9
1,2,3,7,8-PeCDD	34.5	x	0.5	=	17.3
1,2,3,4,7,8-HxCDD	62.7	x	0.1	=	6.27
1,2,3,6,7,8-HxCDD	154	x	0.1	=	15.4
1,2,3,7,8,9-HxCDD	163	x	0.1	=	16.3
1,2,3,4,6,7,8-HpCDD	~~3550~~	x	0.01	=	~~35.50~~
1,2,3,4,6,7,8,9-OCDD	~~20860~~	x	0.001	=	~~20.860~~
TOTAL PCDD					~~117.5~~
2,3,7,8-TCDF	43.0	x	0.1	=	4.30
1,2,3,7,8-PeCDF	{0.4}	x	0.05	=	0.02
2,3,4,7,8-PeCDF	29.6	x	0.5	=	14.8
1,2,3,4,7,8-HxCDF	116	x	0.1	=	11.6
1,2,3,6,7,8-HxCDF	57.0	x	0.1	=	5.70
2,3,4,6,7,8-HxCDF	57.0	x	0.1	=	5.70
1,2,3,7,8,9-HxCDF	3.3	x	0.1	=	0.33
1,2,3,4,6,7,8-HpCDF	1030	x	0.01	=	10.30
1,2,3,4,7,8,9-HpCDF	54.9	x	0.01	=	0.549
1,2,3,4,6,7,8,9-OCDF	2060	x	0.001	=	2.060
TOTAL PCDF					55.4

1653

Total EPA TEFs, 1989a: ~~172.9~~ pg/g

{...} indicates that the value is that of a Detection Limit.

GRY_TEF v1.08, MILES 4.22.16

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TLI Project: **59094r1** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB46B** — Analysis File: **W208708**

Client Project:	RFAAP/09604-310			ICal:	WF56142
Sample Matrix:	SOIL	Date Received:	12/07/2002	Spike File:	SPMIT322
TLI ID:	342-92-2	Date Extracted:	12/17/2002	1st CCal:	W022085
		Date Analyzed:	12/21/2002	End CCal:	W208713
Sample Size:	11.690 g	Dilution Factor:	n/a	% Moisture:	14.5
Dry Weight:	9.995 g	Blank File:	W208701	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JWL	% Solids:	85.5

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	2.7			0.65	27:30	
1,2,3,7,8-PeCDD	EMPC		6.8 J,c			
1,2,3,4,7,8-HxCDD	14.2			1.16	34:43	
1,2,3,6,7,8-HxCDD	40.1			1.20	34:47	
1,2,3,7,8,9-HxCDD	35.5			1.25	35:07	
1,2,3,4,6,7,8-HpCDD	1070			1.02	38:08	
~~1,2,3,4,6,7,8,9-OCDD~~	~~6590~~ J,c			0.85	~~41:55~~	E
~~2,3,7,8-TCDF~~	~~47.9~~			0.75	~~26:47~~	
1,2,3,7,8-PeCDF	ND	0.3				
2,3,4,7,8-PeCDF	14.6			1.60	31:16	
1,2,3,4,7,8-HxCDF	60.7			1.22	34:00	
1,2,3,6,7,8-HxCDF	27.0			1.27	34:06	
2,3,4,6,7,8-HxCDF	27.2			1.19	34:36	
1,2,3,7,8,9-HxCDF	2.3			1.27	35:24	J
1,2,3,4,6,7,8-HpCDF	417			1.05	37:05	
1,2,3,4,7,8,9-HpCDF	43.4			1.07	38:40	
1,2,3,4,6,7,8,9-OCDF	1400 J,c			0.88	42:08	

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	29.3	8		47.6	Q
Total PeCDD	23.6 J,c	3		41.3 J,c	
Total HxCDD	194	6		334	
Total HpCDD	1830	2			
Total TCDF	270	11		795 J,c	X
Total PeCDF	185	7		728 J,c	X
Total HxCDF	370	8		1060 J,c	X
Total HpCDF	1260	3		1440 J,c	X

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TLI Project: **59094r1** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **54SB46B** Analysis File: **P024663**

Client Project:	**RFAAP/09604-310**				
Sample Matrix:	**SOIL**	Date Received:	**12/07/2002**	Spike File:	**SPC2NF22**
TLI ID:	**342-92-2**	Date Extracted:	**12/17/2002**	ICal:	**PF56152**
		Date Analyzed:	**12/22/2002**	ConCal:	**P024658**
Sample Size:	**11.690 g**	Dilution Factor:	**n/a**	% Moisture:	**14.5**
Dry Weight:	**9.995 g**	Blank File:	**W208701**	% Lipid:	**n/a**
GC Column:	**DB-225**	Analyst:	**JLD**	% Solids:	**85.5**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	21.0			0.72	22:40	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	231	116	40%-130%	0.74	22:38	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.86	21:35	___

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TLI Project: **59094r1** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB46B** Analysis File: **T026655**

Client Project:	**RFAAP/09604-310**				
Sample Matrix:	**SOIL**	Date Received:	**12/07/2002**	Spike File:	**SPMIT310**
TLI ID:	**342-92-2**	Date Extracted:	**12/17/2002**	ICal:	**TF5D202**
		Date Analyzed:	**12/26/2002**	ConCal:	**T026651**
Sample Size:	**11.690 g**	Dilution Factor:	**10**	% Moisture:	**14.5**
Dry Weight:	**9.995 g**	Blank File:	**W208701**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JLD**	% Solids:	**85.5**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
1,2,3,4,6,7,8,9-OCDD	5320			0.84	41:19	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	5330	121	40%-135%	0.90	41:17	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.21	34:38	___

Data Reviewer: _____ 12/27/2002

MIT3_PSR v1.00, LARS 6.25.05

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TLI Project: **59094r1** — Toxicity Equivalents Report
Client Sample: **54SB46B** — Analysis File: **W208708**

Client Project:	RFAAP/09604-310			ICal:	WF56142
Sample Matrix:	SOIL	Date Received:	12/07/02	Spike File:	SPMIT322
TLI ID:	342-92-2	Date Extracted:	12/17/02	1st CCal:	W022085
		Date Analyzed:	12/21/02	End CCal:	W208713
Sample Size:	11.690 g	Dilution Factor:	1	% Moisture:	14.5
Dry Weight:	9.995 g	Blank File:	W208701	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JWL	% Solids:	85.5

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	2.7	x	1.	=	2.7
1,2,3,7,8-PeCDD	[6.8]	x	0.5	=	3.4
1,2,3,4,7,8-HxCDD	14.2	x	0.1	=	1.42
1,2,3,6,7,8-HxCDD	40.1	x	0.1	=	4.01
1,2,3,7,8,9-HxCDD	35.5	x	0.1	=	3.55
1,2,3,4,6,7,8-HpCDD	1070	x	0.01	=	10.70
1,2,3,4,6,7,8,9-OCDD	~~6590~~	x	0.001	=	~~6.590~~
TOTAL PCDD					~~32.4~~
2,3,7,8-TCDF	21.0	x	0.1	=	2.10
1,2,3,7,8-PeCDF	{0.3}	x	0.05	=	0.02
2,3,4,7,8-PeCDF	14.6	x	0.5	=	7.30
1,2,3,4,7,8-HxCDF	60.7	x	0.1	=	6.07
1,2,3,6,7,8-HxCDF	27.0	x	0.1	=	2.70
2,3,4,6,7,8-HxCDF	27.2	x	0.1	=	2.72
1,2,3,7,8,9-HxCDF	2.3	x	0.1	=	0.23
1,2,3,4,6,7,8-HpCDF	417	x	0.01	=	4.17
1,2,3,4,7,8,9-HpCDF	43.4	x	0.01	=	0.434
1,2,3,4,6,7,8,9-OCDF	1400	x	0.001	=	1.400
TOTAL PCDF					27.14

53.2

Total EPA TEFs, 1989a: ~~59.5~~ pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

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TLI Project: **59094r1** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB49A** — Analysis File: **W208709**

Client Project:	RFAAP/09604-310			ICal:	WF56142
Sample Matrix:	SOIL	Date Received:	12/07/2002	Spike File:	SPMIT322
TLI ID:	342-92-3	Date Extracted:	12/17/2002	1st CCal:	W022085
		Date Analyzed:	12/21/2002	End CCal:	W208713
Sample Size:	12.720 g	Dilution Factor:	n/a	% Moisture:	21.2
Dry Weight:	10.023 g	Blank File:	W208701	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JWL	% Solids:	78.8

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	10.0			0.75	27:30	
1,2,3,7,8-PeCDD	36.9	J,c		1.61	31:36	
1,2,3,4,7,8-HxCDD	43.6			1.10	34:44	
1,2,3,6,7,8-HxCDD	153			1.24	34:49	
1,2,3,7,8,9-HxCDD	147			1.20	35:09	
~~1,2,3,4,6,7,8-HpCDD~~	~~2360~~	~~J,c~~		~~1.02~~	~~38:09~~	~~E~~
~~1,2,3,4,6,7,8,9-OCDD~~	~~7800~~	~~J,c~~		~~0.86~~	~~41:55~~	~~E~~
~~2,3,7,8-TCDF~~	~~270~~			~~0.74~~	~~26:48~~	
1,2,3,7,8-PeCDF	ND	0.3				
2,3,4,7,8-PeCDF	82.3			1.54	31:17	
1,2,3,4,7,8-HxCDF	197			1.25	34:00	
1,2,3,6,7,8-HxCDF	87.5			1.26	34:07	
2,3,4,6,7,8-HxCDF	89.6			1.27	34:37	
1,2,3,7,8,9-HxCDF	5.5			1.28	35:25	
1,2,3,4,6,7,8-HpCDF	870			1.04	37:06	
1,2,3,4,7,8,9-HpCDF	47.4			0.98	38:41	
1,2,3,4,6,7,8,9-OCDF	1060	J,c		0.88	42:08	

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	198	12		215		
Total PeCDD	239 J,c	7				
Total HxCDD	1330	7				
~~Total HpCDD~~	~~4230 J,c~~	~~2~~				~~E~~
Total TCDF	1590	14		1790	J,c	X
Total PeCDF	984	12		1460	J,c	X
Total HxCDF	1630	12		2390	J,c	X
Total HpCDF	2010	3		2320	J,c	X

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TLI Project: **59094r1** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **54SB49A** Analysis File: **P024664**

Client Project:	**RFAAP/09604-310**				
Sample Matrix:	**SOIL**	Date Received:	**12/07/2002**	Spike File:	**SPC2NF22**
TLI ID:	**342-92-3**	Date Extracted:	**12/17/2002**	ICal:	**PF56152**
		Date Analyzed:	**12/22/2002**	ConCal:	**P024658**
Sample Size:	**12.720 g**	Dilution Factor:	**n/a**	% Moisture:	**21.2**
Dry Weight:	**10.023 g**	Blank File:	**W208701**	% Lipid:	**n/a**
GC Column:	**DB-225**	Analyst:	**JLD**	% Solids:	**78.8**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	125	J, i		0.73	22:41	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	290	146	40%-130%	0.73	22:39	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.87	21:37	___

Data Reviewer: _____ 12/23/2002

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TLI Project: **59094r1** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB49A** Analysis File: **T026656**

Client Project:	RFAAP/09604-310				
Sample Matrix:	SOIL	Date Received:	12/07/2002	Spike File:	SPMIT310
TLI ID:	342-92-3	Date Extracted:	12/17/2002	ICal:	TF5D202
		Date Analyzed:	12/26/2002	ConCal:	T026651
Sample Size:	12.720 g	Dilution Factor:	10	% Moisture:	21.2
Dry Weight:	10.023 g	Blank File:	W208701	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JLD	% Solids:	78.8

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
1,2,3,4,6,7,8-HpCDD	1560	J,i		1.00	37:36	___
1,2,3,4,6,7,8,9-OCDD	5700	J,i		0.86	41:18	___

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total HpCDD	2760	2	J,i		___

Internal Standards	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	3340	152	40%-135%	1.16	37:36	___
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	10220	233	40%-135%	1.53	41:16	RO___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.20	34:38	___

Data Reviewer: _____ 12/27/2002

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TLI Project: **59094r1**
Client Sample: **54SB49A**

Toxicity Equivalents Report
Analysis File: **W208709**

Client Project:	RFAAP/09604-310			ICal:	WF56142
Sample Matrix:	SOIL	Date Received:	12/07/02	Spike File:	SPMIT322
TLI ID:	342-92-3	Date Extracted:	12/17/02	1st CCal:	W022085
		Date Analyzed:	12/21/02	End CCal:	W208713
Sample Size:	12.720 g	Dilution Factor:	1	% Moisture:	21.2
Dry Weight:	10.023 g	Blank File:	W208701	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JWL	% Solids:	78.8

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	10.0	x	1.	=	10.0
1,2,3,7,8-PeCDD	36.9	x	0.5	=	18.5
1,2,3,4,7,8-HxCDD	43.6	x	0.1	=	4.36
1,2,3,6,7,8-HxCDD	153	x	0.1	=	15.3
1,2,3,7,8,9-HxCDD	147	x	0.1	=	14.7
1,2,3,4,6,7,8-HpCDD	~~2360~~	x	0.01	=	~~23.60~~
1,2,3,4,6,7,8,9-OCDD	~~7800~~	x	0.001	=	~~7.800~~
TOTAL PCDD					~~94.3~~
2,3,7,8-TCDF	125	x	0.1	=	12.5
1,2,3,7,8-PeCDF	{0.3}	x	0.05	=	0.02
2,3,4,7,8-PeCDF	82.3	x	0.5	=	41.2
1,2,3,4,7,8-HxCDF	197	x	0.1	=	19.7
1,2,3,6,7,8-HxCDF	87.5	x	0.1	=	8.75
2,3,4,6,7,8-HxCDF	89.6	x	0.1	=	8.96
1,2,3,7,8,9-HxCDF	5.5	x	0.1	=	0.55
1,2,3,4,6,7,8-HpCDF	870	x	0.01	=	8.70
1,2,3,4,7,8,9-HpCDF	47.4	x	0.01	=	0.474
1,2,3,4,6,7,8,9-OCDF	1060	x	0.001	=	1.060
TOTAL PCDF					101.9

Total EPA TEFs, 1989a: ~~196.2~~ pg/g

{...} indicates that the value is that of a Detection Limit.

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TLI Project: **59094r1** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB49B** — Analysis File: **W208710**

Client Project:	RFAAP/09604-310			ICal:	WF56142
Sample Matrix:	SOIL	Date Received:	12/07/2002	Spike File:	SPMIT322
TLI ID:	342-92-4	Date Extracted:	12/17/2002	1st CCal:	W022085
		Date Analyzed:	12/21/2002	End CCal:	W208713
Sample Size:	11.310 g	Dilution Factor:	n/a	% Moisture:	11.5
Dry Weight:	10.009 g	Blank File:	W208701	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JWL	% Solids:	88.5

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.1				—
1,2,3,7,8-PeCDD	ND	0.2				—
1,2,3,4,7,8-HxCDD	ND	0.2				—
1,2,3,6,7,8-HxCDD	ND	0.2				—
1,2,3,7,8,9-HxCDD	ND	0.2				—
1,2,3,4,6,7,8-HpCDD	ND	0.5				—
1,2,3,4,6,7,8,9-OCDD	23.4		J,c	0.83	41:53	—
2,3,7,8-TCDF	ND	0.1				—
1,2,3,7,8-PeCDF	ND	0.1				—
2,3,4,7,8-PeCDF	ND	0.1				—
1,2,3,4,7,8-HxCDF	ND	0.2				—
1,2,3,6,7,8-HxCDF	ND	0.1				—
2,3,4,6,7,8-HxCDF	ND	0.2				—
1,2,3,7,8,9-HxCDF	ND	0.2				—
1,2,3,4,6,7,8-HpCDF	ND	0.3				—
1,2,3,4,7,8,9-HpCDF	ND	0.3				—
1,2,3,4,6,7,8,9-OCDF	ND	0.8				—

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	ND		0.1		—
Total PeCDD	ND		0.2		—
Total HxCDD	0.50	1			—
Total HpCDD	2.4	1			—
Total TCDF	ND		0.1		—
Total PeCDF	0.33	1			—
Total HxCDF	ND		0.2		—
Total HpCDF	ND		0.3		—

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TLI Project: **59094r1**
Client Sample: **54SB49B**

Toxicity Equivalents Report
Analysis File: **W208710**

Client Project:	RFAAP/09604-310			ICal:	WF56142
Sample Matrix:	SOIL	Date Received:	12/07/02	Spike File:	SPMIT322
TLI ID:	342-92-4	Date Extracted:	12/17/02	1st CCal:	W022085
		Date Analyzed:	12/21/02	End CCal:	W208713
Sample Size:	11.310 g	Dilution Factor:	1	% Moisture:	11.5
Dry Weight:	10.009 g	Blank File:	W208701	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JWL	% Solids:	88.5

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.1}	x	1.	=	0.1
1,2,3,7,8-PeCDD	{0.2}	x	0.5	=	0.1
1,2,3,4,7,8-HxCDD	{0.2}	x	0.1	=	0.02
1,2,3,6,7,8-HxCDD	{0.2}	x	0.1	=	0.02
1,2,3,7,8,9-HxCDD	{0.2}	x	0.1	=	0.02
1,2,3,4,6,7,8-HpCDD	{0.5}	x	0.01	=	0.005
1,2,3,4,6,7,8,9-OCDD	23.4	x	0.001	=	0.0234
TOTAL PCDD					0.3
2,3,7,8-TCDF	{0.1}	x	0.1	=	0.01
1,2,3,7,8-PeCDF	{0.1}	x	0.05	=	0.005
2,3,4,7,8-PeCDF	{0.1}	x	0.5	=	0.05
1,2,3,4,7,8-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,6,7,8-HxCDF	{0.1}	x	0.1	=	0.01
2,3,4,6,7,8-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,7,8,9-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,4,6,7,8-HpCDF	{0.3}	x	0.01	=	0.003
1,2,3,4,7,8,9-HpCDF	{0.3}	x	0.01	=	0.003
1,2,3,4,6,7,8,9-OCDF	{0.8}	x	0.001	=	0.0008
TOTAL PCDF					0.14

Total EPA TEFs, 1989a: 0.4 pg/g

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DATA VALIDATION WORKSHEET

Reviewer: AS
Date: 3/12/2003
DV Level: II III IV
Review Document:
__X__ SW-846 __X__ Project QAPP/SAP __X__ NFG EPA 540-R-02-003 (August 2002)

Dioxins and Furans Analysis

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Triangle
SDG No.: 59077
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	

Notes: *cooler 3C*

54SB25A *54SB32A*
54SB25B *54SB32B*
54SB30A *54SB33A*
54SB30B *54SB33B*

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C_+2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	X		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		X	

Notes: *sampled 12/3/02*
extracted 12/9/02
analyzed 12/12/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	X		
3.2	Do any blanks have positive results? Action: If yes, an action level of 5 times the blank value is used to qualify sample results "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.			X

Notes:

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	X		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-".		X	
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.		X	
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥2.5:1 ; CCC ≥10:1) If no, apply "R" to estimated detection limits.	X		
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	X		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51
7	M+2/M+4	1.04	0.88- 1.2
8	M+2	0.89	0.76- 1.02

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	X		

Notes: *ICAL 6/7/02 SF56072, six points, all ratios within limits, %RSD<15%; ass tune at >10000, peak valley at 12%*

CCC S026239 12/11/02 2234, all ratios within limits, %D for targets<20%, RT within limits, S/N 1250:1; ass tune at >10000, peak valley at 14%

1,3,6,8-TCDF at 36.1% and 1,3,6,8-TCDD at 36% - positive bias, not targets & not used for totals, no action taken.

CCC S026253 12/12/02 1010, all ratios within limits, average used, RT within limits, S/N >10:1; ass tune at >10000

1,3,6,8-TCDF at 41%, 1,2,7,8-TCDF at 20.2%, 1,3,6,8-TCDD at 34.1%, and 1,3,7,9-TCDD at 24.7% - positive bias, not targets & not used for totals, no action taken.

$^{13}C_{12}$-OCDD -34.2% - method allows for using average - associated positives flagged "J,c".

ICAL 6/15/02 PF56152, six points, all ratios within limits, %RSD<15%; ass tune at >10000, peak valley at 6%

CCC P024533 12/12/02 1718, all ratios within limits, %D<20%, RT within limits, S/N > 10:1; ass tune at >10000, peak valley at 8%

CCC P024547 12/13/02 0419, all ratios within limits, %D<20%, RT within limits, S/N >10:1; ass tune at >10000, peak valley at 11%

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	X		
5.1a	Is the resolving power ≥10,000 with m/z 304.9824? If not, apply "R".	X		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	X		
5.2	Was a window defining mix analyzed defining descriptor switching times of scan ranges? If not, flag total homologue results "J+/UJ-".	X		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≥ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	X		

Notes:	**SF, DB5**	**PF, DB225**
	RTCHK S026240 12/11/02 2333	*P024532 RTCHK 12/12/02 1625*
		P024534 RS-100 12/12/02 1821

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: *54SB33B*

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	X		
7.2	Was an LCS analyzed for each batch?	X		
7.3	Are there any percent recoveries outside the QC limits of ±20% for targets and ±30% for reference compounds?		X	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	X		
8.2	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	X		

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			X
9.2	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.			X

Notes:

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Were all sample results within the calibrated range, if not apply J.		X	
10.2	Is the signal to noise ion ratios ≥2.5:1 for positive results? If not, flag "J".	X		
10.3	Is the ion abundance ratio within 10% of the ratio in the most current CCC for positive results? If no, this result should be reported as an EMPC.	X		
10.4	Are the two identification peak apexs within 2 seconds for positive identifications? If not, flag "R".	X		
10.5	Was a second column confirmation used for positive 2,3,7,8-TCDF? If no, apply "R" to the 2,3,7,8-TCDF results.		X	
10.6	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	X		

Notes:

54SB25B displayed a positive detection for 2,3,7,8-TCDF that was not reported from the alternate column DB225, applied R.

11.0 Data Completeness		Yes	No	NA
11.1	Is the percent completeness within the control limits? (Control limit 90%)	X		
11.1.1	Number of samples: 8			
11.1.2	Number of target compounds in each analysis: 17			
11.1.3	Number of results rejected and not reported: 1			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = 99%			

Notes:

Radford Army Ammunition Plant
Chain Of Custody Record

No. 1033

Project Number	Project Name

Project Contact (Name and Phone Number)

Samplers:

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HHMM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. (Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Relinquished by:	**Date/time**	**Received by:** (for lab)	**Date/Time**	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

13

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 59094r1_(Revision 1) **Fraction:** Dioxin/Furan

Lab: Triangle **Project Name:** Radford SWMU_54

Reviewer: Andrea_Sansom **Date:** April 17, 2003

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The closing continuing calibration analyzed on 12/22/02 at 0042 displayed internal standard %Ds greater than the control limit (i.e., 30%) with a negative bias for $^{13}C_{12}$-OCDD at 37.7% and $^{13}C_{12}$-PeCDD at 32.6%. The associated positive field sample results were flagged "J,c".

The method blank displayed a positive estimate detection for 1,2,3,4,6,7,8,9-OCDD at 0.52 pg/g. The four associated field samples displayed positive detections greater than five times the blank concentrations, thus, no data qualifying action was taken.

The ion abundance ratio was not met for $^{13}C_{12}$-1,2,3,6,7,8-HxCDD, $^{13}C_{12}$-1,2,3,4,7,8-HxCDD, and $^{13}C_{12}$-HpCDD for sample 54SB49A. The ion abundance ratio was not met for $^{13}C_{12}$-OCDD for the dilution of sample 54SB49A. Since the associated sample results were positive and did not display ion abundance ratios outside the control limits for the associated analytes, no data qualifying action was taken. The internal standard percent recoveries were greater than the upper control limit (i.e., 135%) for $^{13}C_{12}$-OCDD at 233% and $^{13}C_{12}$-1,2,3,6,7,8-HxCDD at 152% for the dilution analysis of sample 54SB49A. The internal standard percent recovery was greater than the upper control limit for $^{13}C_{12}$-2,3,7,8-TCDF at 146% for the 12/21/02 analysis of sample 54SB49A. The associated positive sample results were flagged "J,i".

The laboratory flag "X" indicates that the associated PCDF peak/s has the same retention time as diphenyl ether and that the diphenyl ether contribution to the total PCDF value is greater than ten percent. All PCDF results influenced by this co-elution have been reported as estimate maximum possible concentrations (EMPCs) and were flagged "J,w".

The laboratory flag "E" denotes a reported concentration that exceeds the upper linear range of the initial calibration. These results were flagged "J,q", unless previously qualified for a calibration anomaly. The laboratory ran a dilution of ten for these results and the result from the dilution should be used for data interpretation. The data validator has manually corrected these concentrations used to determine the toxicity equivalent factors.

Correctable Anomalies: None.

Comments: The positive 2,3,7,8-TCDF detection for samples 54SB46A, 54SB46B, and 54SB49A on the DB-5 column were re-analyzed on a DB-225 column that is more suitable for determination of this congener. The DB-225 result for this congener should be used for data interpretation. This concentration has been appropriately used to determine the toxicity equivalent factor.

The laboratory flag "J" represents a reported concentration that was less than the linear range of the initial calibration and an estimate sample result.

Signed: Andrea Sansom

TRIANGLE LABORATORIES, INC.
Transfer Chain-of-Custody Form
Project 59094-r1

Transfer From: DWLH5 To: DMS5

	Initials..	Date.....	Time...
Released by:	JJ	12/19/02	1:23
Accepted by:		12/19/02	1:44

MILES.ID.....	TLI_No.....	Cust.Id.....
59094-r1 -002	342-92-1	54SB46A
59094-r1 -003	342-92-2	54SB46B
59094-r1 -004	342-92-3	54SB49A
59094-r1 -005	342-92-4	54SB49B

XfrCOC (Rev 11/01/94)

Additional comments or instructions:

TLI Project: **59077** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB25A** Analysis File: **S026243**

Client Project:	**Radford Army Ammunition Plant**			ICal:	**SF56072**
Sample Matrix:	**SOIL**	Date Received:	**12/04/2002**	Spike File:	**SPMIT32S**
TLI ID:	**342-70-1**	Date Extracted:	**12/09/2002**	1st CCal:	**S026239**
		Date Analyzed:	**12/12/2002**	End CCal:	**S026253**
Sample Size:	**12.100 g**	Dilution Factor:	**n/a**	% Moisture:	**16.9**
Dry Weight:	**10.055 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JMM**	% Solids:	**83.1**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.2				
1,2,3,7,8-PeCDD	ND	0.3				
1,2,3,4,7,8-HxCDD	ND	0.5				
1,2,3,6,7,8-HxCDD	EMPC		0.57			J
1,2,3,7,8,9-HxCDD	ND	0.5				
1,2,3,4,6,7,8-HpCDD	34.4			1.04	38:14	
1,2,3,4,6,7,8,9-OCDD	1500		J,c	0.85	42:03	
2,3,7,8-TCDF	ND	0.1				
1,2,3,7,8-PeCDF	ND	0.2				
2,3,4,7,8-PeCDF	ND	0.2				
1,2,3,4,7,8-HxCDF	ND	0.2				
1,2,3,6,7,8-HxCDF	ND	0.2				
2,3,4,6,7,8-HxCDF	ND	0.2				
1,2,3,7,8,9-HxCDF	ND	0.3				
1,2,3,4,6,7,8-HpCDF	3.8			1.02	37:10	J
1,2,3,4,7,8,9-HpCDF	ND	0.5				
1,2,3,4,6,7,8,9-OCDF	15.8		J,c	0.82	42:15	

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	ND		0.2			
Total PeCDD	ND		0.3			
Total HxCDD	4.0	2		4.5		
Total HpCDD	70.5	2				
Total TCDF	0.48	1		1.3		
Total PeCDF	EMPC			2.9		
Total HxCDF	2.0	1		4.3	J,w	X
Total HpCDF	12.7	2				

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TLI Project: 59077
Client Sample: 54SB25A

Toxicity Equivalents Report
Analysis File: S026243

Client Project:	Radford Army Ammunition Plant			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/04/02	Spike File:	SPMIT32S
TLI ID:	342-70-1	Date Extracted:	12/09/02	1st CCal:	S026239
		Date Analyzed:	12/12/02	End CCal:	S026253
Sample Size:	12.100 g	Dilution Factor:	1	% Moisture:	16.9
Dry Weight:	10.055 g	Blank File:	S026242	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	83.1

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.2}	x	1.	=	0.2
1,2,3,7,8-PeCDD	{0.3}	x	0.5	=	0.2
1,2,3,4,7,8-HxCDD	{0.5}	x	0.1	=	0.05
1,2,3,6,7,8-HxCDD	[0.57]	x	0.1	=	0.057
1,2,3,7,8,9-HxCDD	{0.5}	x	0.1	=	0.05
1,2,3,4,6,7,8-HpCDD	34.4	x	0.01	=	0.344
1,2,3,4,6,7,8,9-OCDD	1500	x	0.001	=	1.500
TOTAL PCDD					2.4
2,3,7,8-TCDF	{0.1}	x	0.1	=	0.01
1,2,3,7,8-PeCDF	{0.2}	x	0.05	=	0.01
2,3,4,7,8-PeCDF	{0.2}	x	0.5	=	0.1
1,2,3,4,7,8-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,6,7,8-HxCDF	{0.2}	x	0.1	=	0.02
2,3,4,6,7,8-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,7,8,9-HxCDF	{0.3}	x	0.1	=	0.03
1,2,3,4,6,7,8-HpCDF	3.8	x	0.01	=	0.038
1,2,3,4,7,8,9-HpCDF	{0.5}	x	0.01	=	0.005
1,2,3,4,6,7,8,9-OCDF	15.8	x	0.001	=	0.0158
TOTAL PCDF					0.3

Total EPA TEFs, 1989a: 2.7 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

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URS Group, Inc.

TLI Project: **59077** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB25B** — Analysis File: **S026244**

Client Project:	**Radford Army Ammunition Plant**			ICal:	**SF56072**
Sample Matrix:	**SOIL**	Date Received:	**12/04/2002**	Spike File:	**SPMIT32S**
TLI ID:	**342-70-2**	Date Extracted:	**12/09/2002**	1st CCal:	**S026239**
		Date Analyzed:	**12/12/2002**	End CCal:	**S026253**
Sample Size:	**12.200 g**	Dilution Factor:	**n/a**	% Moisture:	**17.4**
Dry Weight:	**10.077 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JMM**	% Solids:	**82.6**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.2				
1,2,3,7,8-PeCDD	ND	0.3				
1,2,3,4,7,8-HxCDD	ND	0.4				
1,2,3,6,7,8-HxCDD	ND	0.4				
1,2,3,7,8,9-HxCDD	ND	0.4				
1,2,3,4,6,7,8-HpCDD	7.4			0.99	38:14	
1,2,3,4,6,7,8,9-OCDD	112	J,c		0.91	42:01	
2,3,7,8-TCDF	0.87	R, P		0.80	26:54	J
1,2,3,7,8-PeCDF	ND	0.2				
2,3,4,7,8-PeCDF	ND	0.2				
1,2,3,4,7,8-HxCDF	0.45			1.17	34:04	J
1,2,3,6,7,8-HxCDF	EMPC		0.15			J
2,3,4,6,7,8-HxCDF	ND	0.2				
1,2,3,7,8,9-HxCDF	ND	0.3				
1,2,3,4,6,7,8-HpCDF	EMPC		0.85			J
1,2,3,4,7,8,9-HpCDF	ND	0.5				
1,2,3,4,6,7,8,9-OCDF	3.7	J,c		0.79	42:13	J

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	ND		0.2		
Total PeCDD	EMPC			0.44	
Total HxCDD	2.4	2			
Total HpCDD	15.1	2			
Total TCDF	3.7	8		3.9	
Total PeCDF	0.96	1		1.3	
Total HxCDF	1.3	2		1.8	
Total HpCDF	2.4	1		3.2	

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TLI Project: 59077
Client Sample: 54SB25B

Toxicity Equivalents Report

Analysis File: S026244

Client Project:	Radford Army Ammunition Plant			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/04/02	Spike File:	SPMIT32S
TLI ID:	342-70-2	Date Extracted:	12/09/02	1st CCal:	S026239
		Date Analyzed:	12/12/02	End CCal:	S026253
Sample Size:	12.200 g	Dilution Factor:	1	% Moisture:	17.4
Dry Weight:	10.077 g	Blank File:	S026242	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	82.6

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.2}	x	1.	=	0.2
1,2,3,7,8-PeCDD	{0.3}	x	0.5	=	0.2
1,2,3,4,7,8-HxCDD	{0.4}	x	0.1	=	0.04
1,2,3,6,7,8-HxCDD	{0.4}	x	0.1	=	0.04
1,2,3,7,8,9-HxCDD	{0.4}	x	0.1	=	0.04
1,2,3,4,6,7,8-HpCDD	7.4	x	0.01	=	0.074
1,2,3,4,6,7,8,9-OCDD	112	x	0.001	=	0.112
TOTAL PCDD					0.7
2,3,7,8-TCDF	0.87	x	0.1	=	0.087
1,2,3,7,8-PeCDF	{0.2}	x	0.05	=	0.01
2,3,4,7,8-PeCDF	{0.2}	x	0.5	=	0.1
1,2,3,4,7,8-HxCDF	0.45	x	0.1	=	0.045
1,2,3,6,7,8-HxCDF	[0.15]	x	0.1	=	0.015
2,3,4,6,7,8-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,7,8,9-HxCDF	{0.3}	x	0.1	=	0.03
1,2,3,4,6,7,8-HpCDF	[0.85]	x	0.01	=	0.0085
1,2,3,4,7,8,9-HpCDF	{0.5}	x	0.01	=	0.005
1,2,3,4,6,7,8,9-OCDF	3.7	x	0.001	=	0.0037
TOTAL PCDF					0.3

Total EPA TEFs, 1989a: 1.0 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

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TLI Project: **59077** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB30A** Analysis File: **S026245**

Client Project:	**Radford Army Ammunition Plant**			ICal:	**SF56072**
Sample Matrix:	**SOIL**	Date Received:	**12/04/2002**	Spike File:	**SPMIT32S**
TLI ID:	**342-70-3**	Date Extracted:	**12/09/2002**	1st CCal:	**S026239**
		Date Analyzed:	**12/12/2002**	End CCal:	**S026253**
Sample Size:	**12.400 g**	Dilution Factor:	**n/a**	% Moisture:	**19.3**
Dry Weight:	**10.007 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JMM**	% Solids:	**80.7**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.3				
1,2,3,7,8-PeCDD	ND	0.4				
1,2,3,4,7,8-HxCDD	ND	0.6				
1,2,3,6,7,8-HxCDD	ND	0.6				
1,2,3,7,8,9-HxCDD	ND	0.6				
1,2,3,4,6,7,8-HpCDD	6.0			1.07	38:14	
1,2,3,4,6,7,8,9-OCDD	122	J,c		0.82	42:02	
2,3,7,8-TCDF	ND	0.2				
1,2,3,7,8-PeCDF	ND	0.3				
2,3,4,7,8-PeCDF	ND	0.3				
1,2,3,4,7,8-HxCDF	ND	0.3				
1,2,3,6,7,8-HxCDF	ND	0.3				
2,3,4,6,7,8-HxCDF	ND	0.3				
1,2,3,7,8,9-HxCDF	ND	0.4				
1,2,3,4,6,7,8-HpCDF	EMPC		0.90			J
1,2,3,4,7,8,9-HpCDF	ND	0.7				
1,2,3,4,6,7,8,9-OCDF	ND	1.3				

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	ND		0.3		
Total PeCDD	ND		0.4		
Total HxCDD	2.9	2			
Total HpCDD	15.2	2			
Total TCDF	ND		0.2		
Total PeCDF	ND		0.3		
Total HxCDF	1.3	2			
Total HpCDF	EMPC			2.2	

MIT3_PSR v1.00, LARS 6.25.05

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TLI Project: **59077** Toxicity Equivalents Report
Client Sample: **54SB30A** Analysis File: **S026245**

Client Project:	**Radford Army Ammunition Plant**			ICal:	**SF56072**
Sample Matrix:	**SOIL**	Date Received:	**12/04/02**	Spike File:	**SPMIT32S**
TLI ID:	**342-70-3**	Date Extracted:	**12/09/02**	1st CCal:	**S026239**
		Date Analyzed:	**12/12/02**	End CCal:	**S026253**
Sample Size:	**12.400 g**	Dilution Factor:	**1**	% Moisture:	**19.3**
Dry Weight:	**10.007 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JMM**	% Solids:	**80.7**

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.3}	x	1.	=	0.3
1,2,3,7,8-PeCDD	{0.4}	x	0.5	=	0.2
1,2,3,4,7,8-HxCDD	{0.6}	x	0.1	=	0.06
1,2,3,6,7,8-HxCDD	{0.6}	x	0.1	=	0.06
1,2,3,7,8,9-HxCDD	{0.6}	x	0.1	=	0.06
1,2,3,4,6,7,8-HpCDD	6.0	x	0.01	=	0.060
1,2,3,4,6,7,8,9-OCDD	122	x	0.001	=	0.122
TOTAL PCDD					0.9
2,3,7,8-TCDF	{0.2}	x	0.1	=	0.02
1,2,3,7,8-PeCDF	{0.3}	x	0.05	=	0.02
2,3,4,7,8-PeCDF	{0.3}	x	0.5	=	0.2
1,2,3,4,7,8-HxCDF	{0.3}	x	0.1	=	0.03
1,2,3,6,7,8-HxCDF	{0.3}	x	0.1	=	0.03
2,3,4,6,7,8-HxCDF	{0.3}	x	0.1	=	0.03
1,2,3,7,8,9-HxCDF	{0.4}	x	0.1	=	0.04
1,2,3,4,6,7,8-HpCDF	[0.90]	x	0.01	=	0.0090
1,2,3,4,7,8,9-HpCDF	{0.7}	x	0.01	=	0.007
1,2,3,4,6,7,8,9-OCDF	{1.3}	x	0.001	=	0.0013
TOTAL PCDF					0.4

Total EPA TEFs, 1989a: 1.2 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

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TLI Project: 59077 — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: 54SB30B — Analysis File: S026246

Client Project:	Radford Army Ammunition Plant			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/04/2002	Spike File:	SPMIT32S
TLI ID:	342-70-4	Date Extracted:	12/09/2002	1st CCal:	S026239
		Date Analyzed:	12/12/2002	End CCal:	S026253
Sample Size:	12.200 g	Dilution Factor:	n/a	% Moisture:	17.6
Dry Weight:	10.053 g	Blank File:	S026242	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	82.4

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.2				
1,2,3,7,8-PeCDD	ND	0.3				
1,2,3,4,7,8-HxCDD	ND	0.4				
1,2,3,6,7,8-HxCDD	ND	0.4				
1,2,3,7,8,9-HxCDD	ND	0.5				
1,2,3,4,6,7,8-HpCDD	4.3			1.04	38:14	J
1,2,3,4,6,7,8,9-OCDD	99.7		J, c	0.78	42:02	
2,3,7,8-TCDF	ND	0.2				
1,2,3,7,8-PeCDF	ND	0.2				
2,3,4,7,8-PeCDF	ND	0.2				
1,2,3,4,7,8-HxCDF	ND	0.2				
1,2,3,6,7,8-HxCDF	ND	0.2				
2,3,4,6,7,8-HxCDF	ND	0.3				
1,2,3,7,8,9-HxCDF	ND	0.3				
1,2,3,4,6,7,8-HpCDF	ND	0.4				
1,2,3,4,7,8,9-HpCDF	ND	0.6				
1,2,3,4,6,7,8,9-OCDF	ND	1.1				

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	ND		0.2		
Total PeCDD	ND		0.3		
Total HxCDD	ND		0.4		
Total HpCDD	9.1	2			
Total TCDF	ND		0.2		
Total PeCDF	ND		0.2		
Total HxCDF	ND		0.3		
Total HpCDF	ND		0.5		

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TLI Project: **59077**
Client Sample: **54SB30B**

Toxicity Equivalents Report

Analysis File: **S026246**

Client Project:	**Radford Army Ammunition Plant**			ICal:	**SF56072**
Sample Matrix:	**SOIL**	Date Received:	**12/04/02**	Spike File:	**SPMIT32S**
TLI ID:	**342-70-4**	Date Extracted:	**12/09/02**	1st CCal:	**S026239**
		Date Analyzed:	**12/12/02**	End CCal:	**S026253**
Sample Size:	**12.200 g**	Dilution Factor:	**1**	% Moisture:	**17.6**
Dry Weight:	**10.053 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JMM**	% Solids:	**82.4**

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.2}	x	1.	=	0.2
1,2,3,7,8-PeCDD	{0.3}	x	0.5	=	0.2
1,2,3,4,7,8-HxCDD	{0.4}	x	0.1	=	0.04
1,2,3,6,7,8-HxCDD	{0.4}	x	0.1	=	0.04
1,2,3,7,8,9-HxCDD	{0.5}	x	0.1	=	0.05
1,2,3,4,6,7,8-HpCDD	4.3	x	0.01	=	0.043
1,2,3,4,6,7,8,9-OCDD	99.7	x	0.001	=	0.0997
TOTAL PCDD					0.7
2,3,7,8-TCDF	{0.2}	x	0.1	=	0.02
1,2,3,7,8-PeCDF	{0.2}	x	0.05	=	0.01
2,3,4,7,8-PeCDF	{0.2}	x	0.5	=	0.1
1,2,3,4,7,8-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,6,7,8-HxCDF	{0.2}	x	0.1	=	0.02
2,3,4,6,7,8-HxCDF	{0.3}	x	0.1	=	0.03
1,2,3,7,8,9-HxCDF	{0.3}	x	0.1	=	0.03
1,2,3,4,6,7,8-HpCDF	{0.4}	x	0.01	=	0.004
1,2,3,4,7,8,9-HpCDF	{0.6}	x	0.01	=	0.006
1,2,3,4,6,7,8,9-OCDF	{1.1}	x	0.001	=	0.0011
TOTAL PCDF					0.2

Total EPA TEFs, 1989a: 0.9 pg/g

{...} indicates that the value is that of a Detection Limit.

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TLI Project: **59077** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB32A** Analysis File: **S026247**

Client Project:	**Radford Army Ammunition Plant**			ICal:	**SF56072**
Sample Matrix:	**SOIL**	Date Received:	**12/04/2002**	Spike File:	**SPMIT32S**
TLI ID:	**342-70-5**	Date Extracted:	**12/09/2002**	1st CCal:	**S026239**
		Date Analyzed:	**12/12/2002**	End CCal:	**S026253**
Sample Size:	**11.600 g**	Dilution Factor:	**n/a**	% Moisture:	**13.7**
Dry Weight:	**10.011 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JMM**	% Solids:	**86.3**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	0.33			0.73	27:35	J__
1,2,3,7,8-PeCDD	1.4			1.70	31:43	J__
1,2,3,4,7,8-HxCDD	1.3			1.12	34:48	J__
1,2,3,6,7,8-HxCDD	4.0			1.17	34:53	J__
1,2,3,7,8,9-HxCDD	4.4			1.09	35:12	J__
1,2,3,4,6,7,8-HpCDD	66.8			1.03	38:14	___
1,2,3,4,6,7,8,9-OCDD	530	J,c		0.85	42:02	___
~~2,3,7,8-TCDF~~	~~7.5~~		See alternate column	~~0.80~~	~~26:55~~	___
1,2,3,7,8-PeCDF	1.8			1.48	30:43	J__
2,3,4,7,8-PeCDF	2.8			1.52	31:23	J__
1,2,3,4,7,8-HxCDF	4.8			1.37	34:04	J__
1,2,3,6,7,8-HxCDF	EMPC		1.8			J__
2,3,4,6,7,8-HxCDF	2.2			1.17	34:41	J__
1,2,3,7,8,9-HxCDF	ND	0.4				___
1,2,3,4,6,7,8-HpCDF	14.3			1.09	37:09	___
1,2,3,4,7,8,9-HpCDF	1.1			0.96	38:44	J__
1,2,3,4,6,7,8,9-OCDF	28.5	J,c		0.89	42:15	___

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	10.6	9				___
Total PeCDD	5.5	3		14.5		___
Total HxCDD	44.0	7				___
Total HpCDD	127	2				___
Total TCDF	52.4	15		55.4		___
Total PeCDF	34.3	12		41.0		___
Total HxCDF	28.5	7		35.2	J,c	X__
Total HpCDF	37.4	3		40.0		___

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TLI Project: **59077** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **54SB32A** Analysis File: **P024536**

Client Project:	**Radford Army Ammunition Plant**				
Sample Matrix:	**SOIL**	Date Received:	**12/04/2002**	Spike File:	**SPC2NF2S**
TLI ID:	**342-70-5**	Date Extracted:	**12/09/2002**	ICal:	**PF56152**
		Date Analyzed:	**12/12/2002**	ConCal:	**P024533**
Sample Size:	**11.600 g**	Dilution Factor:	**n/a**	% Moisture:	**13.7**
Dry Weight:	**10.011 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-225**	Analyst:	**JLD**	% Solids:	**86.3**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	2.0			0.85	22:56	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	121	60.8	40%-130%	0.75	22:55	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.85	21:45	___

Data Reviewer: JLL 12/12/2002

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TLI Project: **59077**
Client Sample: **54SB32A**

Toxicity Equivalents Report
Analysis File: **S026247**

Client Project:	**Radford Army Ammunition Plant**			ICal:	**SF56072**
Sample Matrix:	**SOIL**	Date Received:	**12/04/02**	Spike File:	**SPMIT32S**
TLI ID:	**342-70-5**	Date Extracted:	**12/09/02**	1st CCal:	**S026239**
		Date Analyzed:	**12/12/02**	End CCal:	**S026253**
Sample Size:	**11.600 g**	Dilution Factor:	**1**	% Moisture:	**13.7**
Dry Weight:	**10.011 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JMM**	% Solids:	**86.3**

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	0.33	x	1.	=	0.33
1,2,3,7,8-PeCDD	1.4	x	0.5	=	0.70
1,2,3,4,7,8-HxCDD	1.3	x	0.1	=	0.13
1,2,3,6,7,8-HxCDD	4.0	x	0.1	=	0.40
1,2,3,7,8,9-HxCDD	4.4	x	0.1	=	0.44
1,2,3,4,6,7,8-HpCDD	66.8	x	0.01	=	0.668
1,2,3,4,6,7,8,9-OCDD	530	x	0.001	=	0.530
TOTAL PCDD					3.20
2,3,7,8-TCDF	2.0	x	0.1	=	0.20
1,2,3,7,8-PeCDF	1.8	x	0.05	=	0.090
2,3,4,7,8-PeCDF	2.8	x	0.5	=	1.4
1,2,3,4,7,8-HxCDF	4.8	x	0.1	=	0.48
1,2,3,6,7,8-HxCDF	[1.8]	x	0.1	=	0.18
2,3,4,6,7,8-HxCDF	2.2	x	0.1	=	0.22
1,2,3,7,8,9-HxCDF	{0.4}	x	0.1	=	0.04
1,2,3,4,6,7,8-HpCDF	14.3	x	0.01	=	0.143
1,2,3,4,7,8,9-HpCDF	1.1	x	0.01	=	0.011
1,2,3,4,6,7,8,9-OCDF	28.5	x	0.001	=	0.0285
TOTAL PCDF					2.8

Total EPA TEFs, 1989a: 6.0 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

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TLI Project: **59077** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB32B** Analysis File: **S026248**

Client Project:	**Radford Army Ammunition Plant**			ICal:	**SF56072**
Sample Matrix:	**SOIL**	Date Received:	**12/04/2002**	Spike File:	**SPMIT32S**
TLI ID:	**342-70-6**	Date Extracted:	**12/09/2002**	1st CCal:	**S026239**
		Date Analyzed:	**12/12/2002**	End CCal:	**S026253**
Sample Size:	**11.900 g**	Dilution Factor:	**n/a**	% Moisture:	**15.4**
Dry Weight:	**10.067 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JMM**	% Solids:	**84.6**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	0.51			0.72	27:34	J__
1,2,3,7,8-PeCDD	1.2			1.41	31:42	J__
1,2,3,4,7,8-HxCDD	1.4			1.14	34:47	J__
1,2,3,6,7,8-HxCDD	3.8			1.09	34:53	J__
1,2,3,7,8,9-HxCDD	4.2			1.24	35:12	J__
1,2,3,4,6,7,8-HpCDD	82.7			1.02	38:14	___
1,2,3,4,6,7,8,9-OCDD	663	J, c		0.85	42:02	___
~~2,3,7,8-TCDF~~	~~11.1~~		See also note about this	~~0.86~~	~~26:53~~	___
1,2,3,7,8-PeCDF	2.4			1.45	30:42	J__
2,3,4,7,8-PeCDF	3.3			1.45	31:22	J__
1,2,3,4,7,8-HxCDF	4.0			1.23	34:04	J__
1,2,3,6,7,8-HxCDF	1.8			1.15	34:11	J__
2,3,4,6,7,8-HxCDF	2.2			1.31	34:40	J__
1,2,3,7,8,9-HxCDF	0.42			1.42	35:27	J__
1,2,3,4,6,7,8-HpCDF	15.7			1.07	37:09	___
1,2,3,4,7,8,9-HpCDF	1.5			1.02	38:45	J__
1,2,3,4,6,7,8,9-OCDF	38.5	J, c		0.86	42:15	___

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	8.2	10		9.5		___
Total PeCDD	9.4	7		10.6		___
Total HxCDD	36.0	7				___
Total HpCDD	149	2				___
Total TCDF	58.0	15		60.9		___
Total PeCDF	30.5	10		37.5		___
Total HxCDF	29.3	11		34.8	J, w	X__
Total HpCDF	48.5	3		51.2		___

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TLI Project: **59077** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **54SB32B** Analysis File: **P024537**

Client Project:	**Radford Army Ammunition Plant**				
Sample Matrix:	**SOIL**	Date Received:	**12/04/2002**	Spike File:	**SPC2NF2S**
TLI ID:	**342-70-6**	Date Extracted:	**12/09/2002**	ICal:	**PF56152**
		Date Analyzed:	**12/12/2002**	ConCal:	**P024533**
Sample Size:	**11.900 g**	Dilution Factor:	**n/a**	% Moisture:	**15.4**
Dry Weight:	**10.067 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-225**	Analyst:	**JLD**	% Solids:	**84.6**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	2.6			0.76	22:55	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	96.0	48.3	40%-130%	0.76	22:54	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.81	21:45	___

Data Reviewer: _____ 12/12/2002

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TLI Project: 59077
Client Sample: 54SB32B

Toxicity Equivalents Report
Analysis File: S026248

Client Project:	Radford Army Ammunition Plant			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/04/02	Spike File:	SPMIT32S
TLI ID:	342-70-6	Date Extracted:	12/09/02	1st CCal:	S026239
		Date Analyzed:	12/12/02	End CCal:	S026253
Sample Size:	11.900 g	Dilution Factor:	1	% Moisture:	15.4
Dry Weight:	10.067 g	Blank File:	S026242	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	84.6

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	0.51	x	1.	=	0.51
1,2,3,7,8-PeCDD	1.2	x	0.5	=	0.60
1,2,3,4,7,8-HxCDD	1.4	x	0.1	=	0.14
1,2,3,6,7,8-HxCDD	3.8	x	0.1	=	0.38
1,2,3,7,8,9-HxCDD	4.2	x	0.1	=	0.42
1,2,3,4,6,7,8-HpCDD	82.7	x	0.01	=	0.827
1,2,3,4,6,7,8,9-OCDD	663	x	0.001	=	0.663
TOTAL PCDD					3.54
2,3,7,8-TCDF	2.6	x	0.1	=	0.26
1,2,3,7,8-PeCDF	2.4	x	0.05	=	0.12
2,3,4,7,8-PeCDF	3.3	x	0.5	=	1.7
1,2,3,4,7,8-HxCDF	4.0	x	0.1	=	0.40
1,2,3,6,7,8-HxCDF	1.8	x	0.1	=	0.18
2,3,4,6,7,8-HxCDF	2.2	x	0.1	=	0.22
1,2,3,7,8,9-HxCDF	0.42	x	0.1	=	0.042
1,2,3,4,6,7,8-HpCDF	15.7	x	0.01	=	0.157
1,2,3,4,7,8,9-HpCDF	1.5	x	0.01	=	0.015
1,2,3,4,6,7,8,9-OCDF	38.5	x	0.001	=	0.0385
TOTAL PCDF					3.1

Total EPA TEFs, 1989a: 6.7 pg/g

GRY_TEF v1.08, MILES 4.22.16

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TLI Project: **59077** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB33A** — Analysis File: **S026249**

Client Project:	**Radford Army Ammunition Plant**			ICal:	**SF56072**
Sample Matrix:	**SOIL**	Date Received:	**12/04/2002**	Spike File:	**SPMIT32S**
TLI ID:	**342-70-7**	Date Extracted:	**12/09/2002**	1st CCal:	**S026239**
		Date Analyzed:	**12/12/2002**	End CCal:	**S026253**
Sample Size:	**12.100 g**	Dilution Factor:	**n/a**	% Moisture:	**16.7**
Dry Weight:	**10.079 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**JMM**	% Solids:	**83.3**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	0.83			0.81	27:34	J
1,2,3,7,8-PeCDD	3.6			1.68	31:42	J
1,2,3,4,7,8-HxCDD	4.6			1.27	34:48	J
1,2,3,6,7,8-HxCDD	19.6			1.24	34:53	
1,2,3,7,8,9-HxCDD	17.8			1.21	35:11	
1,2,3,4,6,7,8-HpCDD	331			1.03	38:14	
1,2,3,4,6,7,8,9-OCDD	3040	J,c		0.84	42:02	
~~2,3,7,8-TCDF~~	~~10.3~~		See alternate column & 5th-6th	~~0.86~~	~~26:54~~	
1,2,3,7,8-PeCDF	2.2			1.44	30:42	J
2,3,4,7,8-PeCDF	3.8			1.33	31:22	J
1,2,3,4,7,8-HxCDF	9.6			1.33	34:04	
1,2,3,6,7,8-HxCDF	EMPC		3.5			J
2,3,4,6,7,8-HxCDF	5.0			1.30	34:40	
1,2,3,7,8,9-HxCDF	1.4			1.41	35:27	J
1,2,3,4,6,7,8-HpCDF	58.6			1.10	37:09	
1,2,3,4,7,8,9-HpCDF	5.5			1.07	38:45	
1,2,3,4,6,7,8,9-OCDF	163	J,c		0.84	42:15	

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	14.5	10		17.1		
Total PeCDD	25.8	7		28.8		
Total HxCDD	165	7				
Total HpCDD	610	2				
Total TCDF	78.4	16		89.6	J,c	X
Total PeCDF	66.0	15		77.6	J,c	X
Total HxCDF	92.7	10		115	J,c	X
Total HpCDF	191	3		203		

MIT3_PSR v1.00, LARS 6.25.05

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TLI Project: **59077** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **54SB33A** Analysis File: **P024538**

Client Project:	**Radford Army Ammunition Plant**				
Sample Matrix:	**SOIL**	Date Received:	**12/04/2002**	Spike File:	**SPC2NF2S**
TLI ID:	**342-70-7**	Date Extracted:	**12/09/2002**	ICal:	**PF56152**
		Date Analyzed:	**12/12/2002**	ConCal:	**P024533**
Sample Size:	**12.100 g**	Dilution Factor:	**n/a**	% Moisture:	**16.7**
Dry Weight:	**10.079 g**	Blank File:	**S026242**	% Lipid:	**n/a**
GC Column:	**DB-225**	Analyst:	**JLD**	% Solids:	**83.3**

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	2.9			0.70	22:56	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	128	64.7	40%-130%	0.76	22:54	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.82	21:45	___

Data Reviewer: _____ 12/12/2002

C2NF_PSR v2.03, LARS 6.25.05

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TLI Project: 59077
Client Sample: 54SB33A

Toxicity Equivalents Report
Analysis File: S026249

Client Project:	Radford Army Ammunition Plant			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/04/02	Spike File:	SPMIT32S
TLI ID:	342-70-7	Date Extracted:	12/09/02	1st CCal:	S026239
		Date Analyzed:	12/12/02	End CCal:	S026253
Sample Size:	12.100 g	Dilution Factor:	1	% Moisture:	16.7
Dry Weight:	10.079 g	Blank File:	S026242	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	83.3

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	0.83	x	1.	=	0.83
1,2,3,7,8-PeCDD	3.6	x	0.5	=	1.8
1,2,3,4,7,8-HxCDD	4.6	x	0.1	=	0.46
1,2,3,6,7,8-HxCDD	19.6	x	0.1	=	1.96
1,2,3,7,8,9-HxCDD	17.8	x	0.1	=	1.78
1,2,3,4,6,7,8-HpCDD	331	x	0.01	=	3.31
1,2,3,4,6,7,8,9-OCDD	3040	x	0.001	=	3.040
TOTAL PCDD					13.2
2,3,7,8-TCDF	2.9	x	0.1	=	0.29
1,2,3,7,8-PeCDF	2.2	x	0.05	=	0.11
2,3,4,7,8-PeCDF	3.8	x	0.5	=	1.9
1,2,3,4,7,8-HxCDF	9.6	x	0.1	=	0.96
1,2,3,6,7,8-HxCDF	[3.5]	x	0.1	=	0.35
2,3,4,6,7,8-HxCDF	5.0	x	0.1	=	0.50
1,2,3,7,8,9-HxCDF	1.4	x	0.1	=	0.14
1,2,3,4,6,7,8-HpCDF	58.6	x	0.01	=	0.586
1,2,3,4,7,8,9-HpCDF	5.5	x	0.01	=	0.055
1,2,3,4,6,7,8,9-OCDF	163	x	0.001	=	0.163
TOTAL PCDF					5.1

Total EPA TEFs, 1989a: 18.2 pg/g

[...] indicates that the value is that of an EMPC.

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TLI Project: 59077 — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: 54SB33B — Analysis File: S026250

Client Project:	Radford Army Ammunition Plant			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/04/2002	Spike File:	SPMIT32S
TLI ID:	342-70-8	Date Extracted:	12/09/2002	1st CCal:	S026239
		Date Analyzed:	12/12/2002	End CCal:	S026253
Sample Size:	12.600 g	Dilution Factor:	n/a	% Moisture:	20.4
Dry Weight:	10.030 g	Blank File:	S026242	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	79.6

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.2				
1,2,3,7,8-PeCDD	ND	0.2				
1,2,3,4,7,8-HxCDD	ND	0.4				
1,2,3,6,7,8-HxCDD	ND	0.3				
1,2,3,7,8,9-HxCDD	ND	0.4				
1,2,3,4,6,7,8-HpCDD	EMPC		1.0			J
1,2,3,4,6,7,8,9-OCDD	62.0	J,c		0.83	42:02	
2,3,7,8-TCDF	ND	0.1				
1,2,3,7,8-PeCDF	ND	0.2				
2,3,4,7,8-PeCDF	ND	0.2				
1,2,3,4,7,8-HxCDF	ND	0.2				
1,2,3,6,7,8-HxCDF	ND	0.2				
2,3,4,6,7,8-HxCDF	ND	0.2				
1,2,3,7,8,9-HxCDF	ND	0.3				
1,2,3,4,6,7,8-HpCDF	ND	0.3				
1,2,3,4,7,8,9-HpCDF	ND	0.4				
1,2,3,4,6,7,8,9-OCDF	ND	0.8				

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	ND		0.2		
Total PeCDD	ND		0.2		
Total HxCDD	ND		0.4		
Total HpCDD	2.6	1		3.7	
Total TCDF	ND		0.1		
Total PeCDF	ND		0.2		
Total HxCDF	ND		0.2		
Total HpCDF	ND		0.3		

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URS Group, Inc.

TLI Project: 59077
Client Sample: 54SB33B

Toxicity Equivalents Report
Analysis File: S026250

Client Project:	Radford Army Ammunition Plant			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/04/02	Spike File:	SPMIT32S
TLI ID:	342-70-8	Date Extracted:	12/09/02	1st CCal:	S026239
		Date Analyzed:	12/12/02	End CCal:	S026253
Sample Size:	12.600 g	Dilution Factor:	1	% Moisture:	20.4
Dry Weight:	10.030 g	Blank File:	S026242	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	79.6

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.2}	x	1.	=	0.2
1,2,3,7,8-PeCDD	{0.2}	x	0.5	=	0.1
1,2,3,4,7,8-HxCDD	{0.4}	x	0.1	=	0.04
1,2,3,6,7,8-HxCDD	{0.3}	x	0.1	=	0.03
1,2,3,7,8,9-HxCDD	{0.4}	x	0.1	=	0.04
1,2,3,4,6,7,8-HpCDD	[1.0]	x	0.01	=	0.010
1,2,3,4,6,7,8,9-OCDD	62.0	x	0.001	=	0.0620
TOTAL PCDD					0.5
2,3,7,8-TCDF	{0.1}	x	0.1	=	0.01
1,2,3,7,8-PeCDF	{0.2}	x	0.05	=	0.01
2,3,4,7,8-PeCDF	{0.2}	x	0.5	=	0.1
1,2,3,4,7,8-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,6,7,8-HxCDF	{0.2}	x	0.1	=	0.02
2,3,4,6,7,8-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,7,8,9-HxCDF	{0.3}	x	0.1	=	0.03
1,2,3,4,6,7,8-HpCDF	{0.3}	x	0.01	=	0.003
1,2,3,4,7,8,9-HpCDF	{0.4}	x	0.01	=	0.004
1,2,3,4,6,7,8,9-OCDF	{0.8}	x	0.001	=	0.0008
TOTAL PCDF					0.2

Total EPA TEFs, 1989a: 0.7 pg/g

[...] indicates that the value is that of an EMPC.
{...} indicates that the value is that of a Detection Limit.

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DATA VALIDATION WORKSHEET

Reviewer: AS
Date: 33/11/03
DV Level: II III IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002)

Dioxins and Furans Analysis

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Triangle
SDG No.: 59113
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	

Notes: *cooler 4C*

54SB46A
54SB46B
54SB49A
54SB49B

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ±2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	X		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		X	

Notes: *sampled 12/4/02*
extracted 12/17/02
analyzed 12/21, 22 ,& 26/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	X		
3.2	Do any blanks have positive results? Action: If yes, an action level of 5 times the blank value is used to qualify sample results "B".	X		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.			X

Notes:

1,2,3,4,6,7,8,9-OCDD 0.52 pg/g J

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	X		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-".	X		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.		X	
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥2.5:1 ; CCC ≥10:1) If no, apply "R" to estimated detection limits.	X		
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	X		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51
7	M+2/M+4	1.04	0.88- 1.2
8	M+2	0.89	0.76- 1.02

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	X		

Notes: *ICAL 6/14/02 WF56142, six points, all ratios within limits, %RSD<15%; ass tune at >10000, peak valley at 10%*

CCC W022085 12/21/02 1256, all ratios within limits, %D<20%, RT within limits, S/N 1250:1; ass tune at >10000, peak valley at 14%

*CCC W208713 12/22/02 0042, all ratios within limits, average used, RT within limits*ass tune at >10000

$^{13}C_{12}$-OCDD -37.7% and 13C12-PeCDD -32.6% - *method allows for using average* associated positives flagged "J,c".

ICAL 6/15/02 PF56152, six points, all ratios within limits, %RSD<15%; ass tune at >10000, peak valley at 6%

CCC P024658 12/22/02 1257, all ratios within limits, %D<20%, RT within limits, ass tune at >10000, peak valley at 17%

CCC P024665 12/22/02 2322, all ratios within limits, %D<20%, RT within limits, S/N >10:1; ass tune at >10000, peak valley at 21%

ICAL 12/20/02 Tf5D202, six points, all ratios within limits, %RSD<15%; ass tune at >10000, peak valley at 13%

CCC T026651 12/26/02 1221, all ratios within limits, %D<20%, RT within limits, S/N 2500:1; ass tune at >10000, peak valley at 15%

CCC T026666 12/27/02 0001, all ratios within limits, %D<20%, RT within limits, S/N 1666:1; ass tune at >10000, peak valley at 14%

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	X		
5.1a	Is the resolving power ≥10,000 with m/z 304.9824? If not, apply "R".	X		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	X		
5.2	Was a window defining mix analyzed defining descriptor switching times of scan ranges? If not, flag total homologue results "J+/UJ-".	X		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≥ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	X		

Notes:	**WF, DB5**	**PF, DB225**	**TF, DB5**
	RTCHK W022086 12/21/02	*P024657 RTCHK 12/22/02 1158*	*T026652 RTCHK 12/26/02 1408*
		P024659 RS-100 12/22/02 1359	*T026653 RS-AIS 12/26/02 1528*

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			X
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			X
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			X
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			X
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	X		
7.2	Was an LCS analyzed for each batch?	X		
7.3	Are there any percent recoveries outside the QC limits of ±20% for targets and ±30% for reference compounds?		X	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.		X	
8.2	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	X		

Notes: *The ion abundance ratio was not met for $^{13}C_{12}$-1,2,3,6,7,8-HxCDD, $^{13}C_{12}$-1,2,3,4,7,8-HxCDD, and $^{13}C_{12}$-HpCDD for sample 54SB49A.*

The ion abundance ratio was not met for $^{13}C_{12}$-OCDD for the dilution of sample 54SB49A.

Since the associated sample results were positive and did not display ion ratios out for the associated analytes, no data qualifying action was taken.

The %R was greater than the upper control limit for $^{13}C_{12}$-OCDD at 233% and $^{13}C_{12}$-1,2,3,6,7,8-HxCDD at 152% for the dilution of sample 54SB49A.

Positive associated field sample results were flagged J,i.

9.0 Field Duplicate		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			X
9.2	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommendedabove should be noted during data validation and discussed in the DV report.			X

Notes:

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Were all sample results within the calibrated range, if not apply J.		X	
10.2	Is the signal to noise ion ratios ≥2.5:1 for positive results? If not, flag "J".	X		
10.3	Is the ion abundance ratio within 10% of the ratio in the most current CCC for positive results? If no, this result should be reported as an EMPC.	X		
10.4	Are the two identification peak apexs within 2 seconds for positive identifications? If not, flag "R".	X		
10.5	Was a second column confirmation used for positive 2,3,7,8-TCDF? If no, apply "R" to the 2,3,7,8-TCDF results.	X		
10.6	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	X		

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is the percent completeness within the control limits? (Control limit 90%)	X		
11.1.1	Number of samples:			
11.1.2	Number of target compounds in each analysis:			
11.1.3	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = 100%			

Notes:

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1036

Project Number	Project Name
07604-310	RFAAP

Project Contact (Name and Phone Number): Darren Gurnee

Samplers: Fisher / Spangler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B46 A	12/4/02 1040	5		X	W	E		1							X								
545B46 B	12/4/02 1050	5		X	W	E		1							X								
545B49 A	12/4/02 1115	5		X	W	E		1							X								
545B49 B	12/4/02 1125	5		X	W	E		1							X								

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other ____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other ____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other ____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature] 12/4/02	800				
Relinquished by:	Date/time	Received by: (for laboratory) [signature]	Date/Time 12/5/02 0943	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 59113_(Revision 1) **Fraction:** Dioxin/Furan

Lab: Triangle **Project Name:** Radford SWMU_54

Reviewer: Andrea_Sansom **Date:** April 17, 2003

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The closing continuing calibration analyzed on 12/14/02 at 1046 displayed an internal standard %D greater than the control limit (i.e., 30%) for $^{13}C_{12}$-OCDD at 40.8%. The associated positive field sample results were flagged "J,c".

The method blank displayed positive estimate detections for 1,2,3,4,6,7,8,9-OCDD at 1.5 pg/g, 1,2,3,4,7,8-HxCDF at 0.14 pg/g, 1,2,3,4,6,7,8,9-OCDF at 0.50 pg/g, and total HxCDF at 0.14 pg/g. The method blank also displayed estimate maximum possible concentrations (EMPCs) for 1,2,3,4,6,7,8-HpCDD at 0.42 pg/g and total HpCDD at 0.42 pg/g. The two associated field samples displayed positive detections greater than five times the blank concentrations, thus, no data qualifying action was taken.

The laboratory flag "X" indicates that the associated PCDF peak/s has the same retention time as diphenyl ether and that the diphenyl ether contribution to the total PCDF value is greater than ten percent. All PCDF results influenced by this co-elution have been reported as EMPCs and were flagged "J,w".

The laboratory flag "E" applied to the sample 54SB48A's OCDD result denotes a reported concentration that exceeds the upper linear range of the initial calibration. The data validator would have applied "J,q" to this result, however, this result was previously qualified for a calibration anomaly.

Correctable Anomalies: None.

Comments: The positive 2,3,7,8-TCDF detection for samples 54SB48A and 54SB55A on the DB-5 column were re-analyzed on a DB-225 column, which is more suitable to the determination of this congener. The DB-225 result for this congener should be used for data interpretation. This concentration has been appropriately used to determine the toxicity equivalent factor.

Signed: Andrea Sansom

TRIANGLE LABORATORIES, INC.
Transfer Chain-of-Custody Form
Project 59113

Transfer From: DWLH5 To: DMS5

	Initials..	Date.....	Time...
Released by:	JJ	12/12/02	21:56
Accepted by:	J	12/13/02	00:02

MILES.ID.....		TLI_No.....	Cust.Id.....
59113-	-002	343-8-1	54SB55A
59113-	-004	343-8-3	54SB48A

XfrCOC (Rev 11/01/94)

Additional comments or instructions:

TLI Project: **59113** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB48A** Analysis File: **S026305**

Client Project:	RFAAP/09604-310			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/10/2002	Spike File:	SPMIT32S
TLI ID:	343-8-3	Date Extracted:	12/11/2002	1st CCal:	S026295
		Date Analyzed:	12/14/2002	End CCal:	S026308
Sample Size:	12.510 g	Dilution Factor:	n/a	% Moisture:	19.6
Dry Weight:	10.058 g	Blank File:	S026300	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	80.4

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	1.3			0.79	27:27	
1,2,3,7,8-PeCDD	5.0			1.57	31:36	
1,2,3,4,7,8-HxCDD	7.6			1.15	34:40	
1,2,3,6,7,8-HxCDD	18.8			1.22	34:46	
1,2,3,7,8,9-HxCDD	21.0			1.18	35:05	
1,2,3,4,6,7,8-HpCDD	495			1.03	38:06	
1,2,3,4,6,7,8,9-OCDD	4230	J,e		0.85	41:53	E
~~2,3,7,8-TCDF~~	~~30.0~~			~~0.87~~	~~26:46~~	
1,2,3,7,8-PeCDF	7.4			1.47	30:34	
2,3,4,7,8-PeCDF	11.9			1.46	31:16	
1,2,3,4,7,8-HxCDF	26.3			1.29	33:58	
1,2,3,6,7,8-HxCDF	11.4			1.30	34:04	
2,3,4,6,7,8-HxCDF	12.3			1.28	34:34	
1,2,3,7,8,9-HxCDF	ND	0.2				
1,2,3,4,6,7,8-HpCDF	147			1.09	37:02	
1,2,3,4,7,8,9-HpCDF	14.1			1.11	38:37	
1,2,3,4,6,7,8,9-OCDF	435	J,e		0.89	42:05	

Totals	Conc. (pg/g)	Number	DL	EMPC		Flags
Total TCDD	29.4	10		31.5		
Total PeCDD	28.7	7		35.7		
Total HxCDD	146	7				
Total HpCDD	881	2				
Total TCDF	266	19		287		
Total PeCDF	205	18		241	J,w	X
Total HxCDF	217	11		270	J,w	X
Total HpCDF	444	3		478		

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TLI Project: **59113** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **54SB48A** Analysis File: **P024589**

Client Project:	RFAAP/09604-310				
Sample Matrix:	SOIL	Date Received:	12/10/2002	Spike File:	SPC2NF2S
TLI ID:	343-8-3	Date Extracted:	12/11/2002	ICal:	PF56152
		Date Analyzed:	12/16/2002	ConCal:	P024582
Sample Size:	12.510 g	Dilution Factor:	n/a	% Moisture:	19.6
Dry Weight:	10.058 g	Blank File:	S026300	% Lipid:	n/a
GC Column:	DB-225	Analyst:	JSY	% Solids:	80.4

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	9.6			0.86	22:36	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	177	89.0	40%-130%	0.76	22:35	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.89	21:28	___

Data Reviewer: _____ 12/17/2002

C2NF_PSR v2.03, LARS 6.25.05

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TLI Project: **59113**
Client Sample: **54SB48A**

Toxicity Equivalents Report
Analysis File: **S026305**

Client Project:	RFAAP/09604-310			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/10/02	Spike File:	SPMIT32S
TLI ID:	343-8-3	Date Extracted:	12/11/02	1st CCal:	S026295
		Date Analyzed:	12/14/02	End CCal:	S026308
Sample Size:	12.510 g	Dilution Factor:	1	% Moisture:	19.6
Dry Weight:	10.058 g	Blank File:	S026300	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	80.4

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	1.3	x	1.	=	1.3
1,2,3,7,8-PeCDD	5.0	x	0.5	=	2.5
1,2,3,4,7,8-HxCDD	7.6	x	0.1	=	0.76
1,2,3,6,7,8-HxCDD	18.8	x	0.1	=	1.88
1,2,3,7,8,9-HxCDD	21.0	x	0.1	=	2.10
1,2,3,4,6,7,8-HpCDD	495	x	0.01	=	4.95
1,2,3,4,6,7,8,9-OCDD	4230	x	0.001	=	4.230
TOTAL PCDD					17.7
2,3,7,8-TCDF	9.6	x	0.1	=	0.96
1,2,3,7,8-PeCDF	7.4	x	0.05	=	0.37
2,3,4,7,8-PeCDF	11.9	x	0.5	=	5.95
1,2,3,4,7,8-HxCDF	26.3	x	0.1	=	2.63
1,2,3,6,7,8-HxCDF	11.4	x	0.1	=	1.14
2,3,4,6,7,8-HxCDF	12.3	x	0.1	=	1.23
1,2,3,7,8,9-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,4,6,7,8-HpCDF	147	x	0.01	=	1.47
1,2,3,4,7,8,9-HpCDF	14.1	x	0.01	=	0.141
1,2,3,4,6,7,8,9-OCDF	435	x	0.001	=	0.435
TOTAL PCDF					14.35

Total EPA TEFs, 1989a: 32.1 pg/g

{...} indicates that the value is that of a Detection Limit.

GRY_TEF v1.08, MILES 4.22.16

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TLI Project: **59113** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB55A** Analysis File: **S026304**

Client Project:	RFAAP/09604-310			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/10/2002	Spike File:	SPMIT32S
TLI ID:	343-8-1	Date Extracted:	12/11/2002	1st CCal:	S026295
		Date Analyzed:	12/14/2002	End CCal:	S026308
Sample Size:	13.370 g	Dilution Factor:	n/a	% Moisture:	25.1
Dry Weight:	10.014 g	Blank File:	S026300	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	74.9

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	2.7			0.71	27:29	
1,2,3,7,8-PeCDD	9.9			1.55	31:39	
1,2,3,4,7,8-HxCDD	8.5			1.10	34:44	
1,2,3,6,7,8-HxCDD	14.3			1.26	34:49	
1,2,3,7,8,9-HxCDD	22.7			1.20	35:08	
1,2,3,4,6,7,8-HpCDD	204			1.04	38:09	
1,2,3,4,6,7,8,9-OCDD	1210			0.85	41:56	
2,3,7,8-TCDF	134			0.85	26:49	
1,2,3,7,8-PeCDF	37.5			1.46	30:38	
2,3,4,7,8-PeCDF	56.7			1.51	31:19	
1,2,3,4,7,8-HxCDF	91.6			1.29	34:00	
1,2,3,6,7,8-HxCDF	40.4			1.30	34:07	
2,3,4,6,7,8-HxCDF	38.6			1.31	34:37	
1,2,3,7,8,9-HxCDF	5.7			1.18	35:23	
1,2,3,4,6,7,8-HpCDF	125			1.07	37:05	
1,2,3,4,7,8,9-HpCDF	16.1			1.03	38:40	
1,2,3,4,6,7,8,9-OCDF	211			0.88	42:09	

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	146	11		147	
Total PeCDD	108	9		154	
Total HxCDD	181	7			
Total HpCDD	391	2			
Total TCDF	944	16		951	
Total PeCDF	690	16		692	
Total HxCDF	428	11		439	
Total HpCDF	274	4			

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TLI Project: **59113** Method 8290 TCDD/TCDF Analysis (DB-225)
Client Sample: **54SB55A** Analysis File: **P024588**

Client Project:	RFAAP/09604-310				
Sample Matrix:	SOIL	Date Received:	12/10/2002	Spike File:	SPC2NF2S
TLI ID:	343-8-1	Date Extracted:	12/11/2002	ICal:	PF56152
		Date Analyzed:	12/16/2002	ConCal:	P024582
Sample Size:	13.370 g	Dilution Factor:	n/a	% Moisture:	25.1
Dry Weight:	10.014 g	Blank File:	S026300	% Lipid:	n/a
GC Column:	DB-225	Analyst:	JSY	% Solids:	74.9

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDF	28.5			0.88	22:39	___

Internal Standard	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	189	94.5	40%-130%	0.75	22:39	___

Recovery Standard	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.83	21:32	___

Data Reviewer: _____ 12/17/2002

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TLI Project: **59113**
Client Sample: **54SB55A**

Toxicity Equivalents Report
Analysis File: **S026304**

Client Project:	RFAAP/09604-310			ICal:	SF56072
Sample Matrix:	SOIL	Date Received:	12/10/02	Spike File:	SPMIT32S
TLI ID:	343-8-1	Date Extracted:	12/11/02	1st CCal:	S026295
		Date Analyzed:	12/14/02	End CCal:	S026308
Sample Size:	13.370 g	Dilution Factor:	1	% Moisture:	25.1
Dry Weight:	10.014 g	Blank File:	S026300	% Lipid:	n/a
GC Column:	DB-5	Analyst:	JMM	% Solids:	74.9

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	2.7	x	1.	=	2.7
1,2,3,7,8-PeCDD	9.9	x	0.5	=	5.0
1,2,3,4,7,8-HxCDD	8.5	x	0.1	=	0.85
1,2,3,6,7,8-HxCDD	14.3	x	0.1	=	1.43
1,2,3,7,8,9-HxCDD	22.7	x	0.1	=	2.27
1,2,3,4,6,7,8-HpCDD	204	x	0.01	=	2.04
1,2,3,4,6,7,8,9-OCDD	1210	x	0.001	=	1.210
TOTAL PCDD					15.5
2,3,7,8-TCDF	28.5	x	0.1	=	2.85
1,2,3,7,8-PeCDF	37.5	x	0.05	=	1.88
2,3,4,7,8-PeCDF	56.7	x	0.5	=	28.4
1,2,3,4,7,8-HxCDF	91.6	x	0.1	=	9.16
1,2,3,6,7,8-HxCDF	40.4	x	0.1	=	4.04
2,3,4,6,7,8-HxCDF	38.6	x	0.1	=	3.86
1,2,3,7,8,9-HxCDF	5.7	x	0.1	=	0.57
1,2,3,4,6,7,8-HpCDF	125	x	0.01	=	1.25
1,2,3,4,7,8,9-HpCDF	16.1	x	0.01	=	0.161
1,2,3,4,6,7,8,9-OCDF	211	x	0.001	=	0.211
TOTAL PCDF					52.4

Total EPA TEFs, 1989a: 67.9 pg/g

GRY_TEF v1.08, MILES 4.22.16

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DATA VALIDATION WORKSHEET

Reviewer: AS
Date: 33/11/03
DV Level: II III IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002)

Dioxins and Furans Analysis

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Triangle
SDG No.: 59113
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?		x	
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	

Notes: cooler 4C — 54SB55A
54SB55B and 54SB48B that are on COC can be found in SDG 59113H, appear to be grouped by necessity of second column confirmation for TCDF — 54SB48A

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	x		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		x	

Notes: sampled 12/9/02
extracted 12/11/02
analyzed 12/14&16/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	x		
3.2	Do any blanks have positive results? Action: If yes, an action level of 5 times the blank value is used to qualify sample results "B".	x		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.			x

Notes:					
	1,2,3,4,6,7,8-HpCDD	0.42 pg/g J; EMPC	1,2,3,4,6,7,8,9-OCDF	0.5 pg/g J
	1,2,3,4,6,7,8,9-OCDD	1.5 pg/g J	total HpCDD	0.42 pg/g J; EMPC
	1,2,3,47,8-HxCDF	0.14 pg/g J	total HxCDF	0.14 pg/g

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	x		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-".	x		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.		x	
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥2.5:1 ; CCC ≥10:1) If no, apply "R" to estimated detection limits.	x		
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	x		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51
7	M+2/M+4	1.04	0.88- 1.2
8	M+2	0.89	0.76- 1.02

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	x		

Notes: ICAL 6/7/02 SF56072, six points, all ratios within limits, %RSD<15%; ass tune at >10000, peak valley at 13%

CCC S026295 12/13/02 2344, all ratios within limits, %D<20%, RT within limits, S/N 1250:1; ass tune at >10000, peak valley at 14%

CCC S026308 12/14/02 1046, all ratios within limits, average used, RT within limits; ass tune at >10000

$^{13}C_{12}$-OCDD -40.8% - method allows for using average - associated positives flagged "J,c".

ICAL 6/15/02 PF56152, six points, all ratios within limits, %RSD<15%; ass tune at >10000, peak valley at 6%

CCC P024582 12/16/02 1828, all ratios within limits, %D<20%, RT within limits, S/N 5000:1; ass tune at >10000, peak valley at 6%

CCC P024596 12/17/02 0525, all ratios within limits, %D<20%, RT within limits, S/N 5000:1; ass tune at >10000, peak valley at 24%

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	x		
5.1a	Is the resolving power ≥10,000 with m/z 304.9824? If not, apply "R".	x		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	x		
5.2	Was a window defining mix analyzed defining descriptor switching times of scan ranges? If not, flag total homologue results "J+/UJ-".	x		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≥ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	x		

Notes:	**DB5**	**DB225**	
	RTCHK S026292 12/13/02 1917	P024580 RTCHK 12/16/02 1227	P024597 RTCHK 12/17/02
	RTCHK S026309 12/14/02 end of sequence	P024583 RS-100 12/16/02 1929	P024598 RS-100 12/17/02

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			x
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			x
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			x
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			x
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	x		
7.2	Was an LCS analyzed for each batch?	x		
7.3	Are there any percent recoveries outside the QC limits of ±30% for targets and ±30% for reference compounds?		x	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	x		
8.2	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	x		

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			x
9.2	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			x

Notes:

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Were all sample results within the calibrated range, if not apply J.		x	
10.2	Is the signal to noise ion ratios ≥2.5:1 for positive results? If not, flag "J".	x		
10.3	Is the ion abundance ratio within 10% of the ratio in the most current CCC for positive results? If no, this result should be reported as an EMPC.	x		
10.4	Are the two identification peak apexs within 2 seconds for positive identifications? If not, flag "R".	x		
10.5	Was a second column confirmation used for positive 2,3,7,8-TCDF? If no, apply "R" to the 2,3,7,8-TCDF results.	x		
10.6	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	x		

Notes: 54SB48A 1,2,3,4,6,7,8,9-OCDD result exceeds the linear range of the instrument, laboratory qualified as "E" - method does not require a dilution for this analyte was previously flagged "J,c" therefore no further action was taken.

11.0 Data Completeness		Yes	No	NA
11.1	Is the percent completeness within the control limits? (Control limit 90%)	x		
11.1.1	Number of samples:			
11.1.2	Number of target compounds in each analysis:			
11.1.3	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness =			

Notes:

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1048

Project Number	Project Name

Project Contact (Name and Phone Number)

Samplers:

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan 8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Relinquished by:	Date/time	Received by: (for lab)	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

13

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 59113H (Revision 1) **Fraction:** Dioxin/Furan

Lab: Triangle **Project Name:** Radford SWMU_54

Reviewer: Andrea Sansom **Date:** April 17, 2003

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: The laboratory flag "J" represents a reported concentration that was less than the linear range of the initial calibration and an estimate sample result.

Signed: Andrea Sansom

URS Group, Inc.

TLI Project: **59113H** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB55B** — Analysis File: **S026382**

Client Project:	RFAAP/09604-310				
Sample Matrix:	SOIL	Date Received:	12/10/2002	Spike File:	SPMIT322
TLI ID:	343-8-2	Date Extracted:	12/12/2002	ICal:	SF56072
		Date Analyzed:	12/18/2002	ConCal:	S026379
Sample Size:	11.000 g	Dilution Factor:	n/a	% Moisture:	8.4
Dry Weight:	10.076 g	Blank File:	S026345	% Lipid:	n/a
GC Column:	DB-5	Analyst:	TTF	% Solids:	91.6

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.4				—
1,2,3,7,8-PeCDD	ND	0.4				—
1,2,3,4,7,8-HxCDD	ND	0.6				—
1,2,3,6,7,8-HxCDD	ND	0.6				—
1,2,3,7,8,9-HxCDD	ND	0.6				—
1,2,3,4,6,7,8-HpCDD	ND	1.4				—
1,2,3,4,6,7,8,9-OCDD	40.8			0.93	41:46	—
2,3,7,8-TCDF	ND	0.3				—
1,2,3,7,8-PeCDF	ND	0.3				—
2,3,4,7,8-PeCDF	ND	0.3				—
1,2,3,4,7,8-HxCDF	ND	0.4				—
1,2,3,6,7,8-HxCDF	ND	0.4				—
2,3,4,6,7,8-HxCDF	ND	0.4				—
1,2,3,7,8,9-HxCDF	ND	0.5				—
1,2,3,4,6,7,8-HpCDF	ND	0.7				—
1,2,3,4,7,8,9-HpCDF	ND	0.9				—
1,2,3,4,6,7,8,9-OCDF	ND	2.1				—

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	ND		0.4		—
Total PeCDD	ND		0.4		—
Total HxCDD	ND		0.6		—
Total HpCDD	ND		1.4		—
Total TCDF	ND		0.3		—
Total PeCDF	ND		0.3		—
Total HxCDF	ND		0.4		—
Total HpCDF	ND		0.8		—

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URS Group, Inc.

TLI Project: **59113H** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB55B** Analysis File: **S026382**

Internal Standards	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	139	70.1	40%-135%	0.75	26:40	___
$^{13}C_{12}$-2,3,7,8-TCDD	131	65.9	40%-135%	0.81	27:22	___
$^{13}C_{12}$-1,2,3,7,8-PeCDF	153	77.0	40%-135%	1.44	30:30	___
$^{13}C_{12}$-1,2,3,7,8-PeCDD	168	84.4	40%-135%	1.43	31:31	___
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	152	76.4	40%-135%	0.51	34:00	___
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	174	87.9	40%-135%	1.22	34:40	___
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	120	60.3	40%-135%	0.42	36:56	___
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	129	65.0	40%-135%	1.01	38:00	___
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	201	50.6	40%-135%	0.82	41:45	___

Surrogate Standards (Type B)	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,4,7,8-PeCDF	154	77.4	40%-135%	1.45	31:11	___
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	146	73.3	40%-135%	0.51	33:54	___
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	153	77.1	40%-135%	1.23	34:36	___
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	107	54.1	40%-135%	0.43	38:31	___

Other Standard	Conc. (pg/g)	% Recovery	QC Limits	RT	Flags
$^{37}Cl_4$-2,3,7,8-TCDD	14.6	73.5	40%-135%	27:22	___

Alternate Standards (Type B)	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	136	68.5	40%-135%	0.52	35:17	___
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	157	79.1	40%-135%	0.51	34:29	___

Recovery Standards	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.80	27:11	___
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.21	35:01	___

Data Reviewer: _____ 12/18/2002

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TLI Project: **59113H**
Client Sample: **54SB55B**

Toxicity Equivalents Report
Analysis File: **S026382**

Client Project:	**RFAAP/09604-310**				
Sample Matrix:	**SOIL**	Date Received:	**12/10/02**	Spike File:	**SPMIT322**
TLI ID:	**343-8-2**	Date Extracted:	**12/12/02**	ICal:	**SF56072**
		Date Analyzed:	**12/18/02**	ConCal:	**S026379**
Sample Size:	**11.000 g**	Dilution Factor:	**1**	% Moisture:	**8.4**
Dry Weight:	**10.076 g**	Blank File:	**S026345**	% Lipid:	**n/a**
GC Column:	**DB-5**	Analyst:	**TTF**	% Solids:	**91.6**

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.4}	x	1.	=	0.4
1,2,3,7,8-PeCDD	{0.4}	x	0.5	=	0.2
1,2,3,4,7,8-HxCDD	{0.6}	x	0.1	=	0.06
1,2,3,6,7,8-HxCDD	{0.6}	x	0.1	=	0.06
1,2,3,7,8,9-HxCDD	{0.6}	x	0.1	=	0.06
1,2,3,4,6,7,8-HpCDD	{1.4}	x	0.01	=	0.014
1,2,3,4,6,7,8,9-OCDD	40.8	x	0.001	=	0.0408
TOTAL PCDD					0.8
2,3,7,8-TCDF	{0.3}	x	0.1	=	0.03
1,2,3,7,8-PeCDF	{0.3}	x	0.05	=	0.02
2,3,4,7,8-PeCDF	{0.3}	x	0.5	=	0.2
1,2,3,4,7,8-HxCDF	{0.4}	x	0.1	=	0.04
1,2,3,6,7,8-HxCDF	{0.4}	x	0.1	=	0.04
2,3,4,6,7,8-HxCDF	{0.4}	x	0.1	=	0.04
1,2,3,7,8,9-HxCDF	{0.5}	x	0.1	=	0.05
1,2,3,4,6,7,8-HpCDF	{0.7}	x	0.01	=	0.007
1,2,3,4,7,8,9-HpCDF	{0.9}	x	0.01	=	0.009
1,2,3,4,6,7,8,9-OCDF	{2.1}	x	0.001	=	0.0021
TOTAL PCDF					0.4

Total EPA TEFs, 1989a: 1.3 pg/g

{...} indicates that the value is that of a Detection Limit.

GRY_TEF v1.08, MILES 4.22.16

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TLI Project: **59113H** — Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB48B** — Analysis File: **S026383**

Client Project:	RFAAP/09604-310				
Sample Matrix:	SOIL	Date Received:	12/10/2002	Spike File:	SPMIT322
TLI ID:	343-8-4	Date Extracted:	12/12/2002	ICal:	SF56072
		Date Analyzed:	12/18/2002	ConCal:	S026379
Sample Size:	11.800 g	Dilution Factor:	n/a	% Moisture:	14.7
Dry Weight:	10.065 g	Blank File:	S026345	% Lipid:	n/a
GC Column:	DB-5	Analyst:	TTF	% Solids:	85.3

Analytes	Conc. (pg/g)	DL	EMPC	Ratio	RT	Flags
2,3,7,8-TCDD	ND	0.3				
1,2,3,7,8-PeCDD	ND	0.3				
1,2,3,4,7,8-HxCDD	ND	0.4				
1,2,3,6,7,8-HxCDD	ND	0.4				
1,2,3,7,8,9-HxCDD	ND	0.3				
1,2,3,4,6,7,8-HpCDD	2.4			1.17	38:00	J
1,2,3,4,6,7,8,9-OCDD	56.2			0.90	41:45	
2,3,7,8-TCDF	ND	0.2				
1,2,3,7,8-PeCDF	ND	0.2				
2,3,4,7,8-PeCDF	ND	0.2				
1,2,3,4,7,8-HxCDF	ND	0.2				
1,2,3,6,7,8-HxCDF	ND	0.2				
2,3,4,6,7,8-HxCDF	ND	0.3				
1,2,3,7,8,9-HxCDF	ND	0.3				
1,2,3,4,6,7,8-HpCDF	ND	0.4				
1,2,3,4,7,8,9-HpCDF	ND	0.5				
1,2,3,4,6,7,8,9-OCDF	ND	1.2				

Totals	Conc. (pg/g)	Number	DL	EMPC	Flags
Total TCDD	ND		0.3		
Total PeCDD	ND		0.3		
Total HxCDD	EMPC			1.1	
Total HpCDD	5.7	2			
Total TCDF	ND		0.2		
Total PeCDF	ND		0.2		
Total HxCDF	ND		0.3		
Total HpCDF	ND		0.5		

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TLI Project: **59113H** Method 8290 PCDD/PCDF Analysis (b)
Client Sample: **54SB48B** Analysis File: **S026383**

Internal Standards	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,7,8-TCDF	115	57.7	40%-135%	0.74	26:38	___
$^{13}C_{12}$-2,3,7,8-TCDD	109	54.7	40%-135%	0.79	27:20	___
$^{13}C_{12}$-1,2,3,7,8-PeCDF	135	67.7	40%-135%	1.44	30:29	___
$^{13}C_{12}$-1,2,3,7,8-PeCDD	155	78.1	40%-135%	1.47	31:29	___
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	145	72.9	40%-135%	0.50	33:58	___
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	169	84.8	40%-135%	1.23	34:39	___
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	122	61.4	40%-135%	0.43	36:55	___
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	134	67.6	40%-135%	1.01	37:58	___
$^{13}C_{12}$-1,2,3,4,6,7,8,9-OCDD	224	56.3	40%-135%	0.80	41:43	___

Surrogate Standards (Type B)	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-2,3,4,7,8-PeCDF	142	71.5	40%-135%	1.46	31:10	___
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	139	69.8	40%-135%	0.51	33:52	___
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	153	77.1	40%-135%	1.24	34:34	___
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	110	55.2	40%-135%	0.45	38:29	___

Other Standard	Conc. (pg/g)	% Recovery	QC Limits	RT	Flags
$^{37}Cl_4$-2,3,7,8-TCDD	12.2	61.5	40%-135%	27:21	___

Alternate Standards (Type B)	Conc. (pg/g)	% Recovery	QC Limits	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	135	68.1	40%-135%	0.50	35:15	___
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	155	77.9	40%-135%	0.51	34:28	___

Recovery Standards	Ratio	RT	Flags
$^{13}C_{12}$-1,2,3,4-TCDD	0.80	27:10	___
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.24	34:59	___

Data Reviewer: VC 12/18/2002

MIT3_PSR v1.00, LARS 6.25.05

Triangle Laboratories, Inc.®
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Phone: (919) 544-5729 • Fax: (919) 544-5491

Printed: 23:20 12/18/2002

URS Group, Inc.

TLI Project: **59113H** — Toxicity Equivalents Report
Client Sample: **54SB48B** — Analysis File: **S026383**

Client Project:	RFAAP/09604-310				
Sample Matrix:	SOIL	Date Received:	12/10/02	Spike File:	SPMIT322
TLI ID:	343-8-4	Date Extracted:	12/12/02	ICal:	SF56072
		Date Analyzed:	12/18/02	ConCal:	S026379
Sample Size:	11.800 g	Dilution Factor:	1	% Moisture:	14.7
Dry Weight:	10.065 g	Blank File:	S026345	% Lipid:	n/a
GC Column:	DB-5	Analyst:	TTF	% Solids:	85.3

Analytes	Conc. (pg/g)		TEF		Equivalent
2,3,7,8-TCDD	{0.3}	x	1.	=	0.3
1,2,3,7,8-PeCDD	{0.3}	x	0.5	=	0.2
1,2,3,4,7,8-HxCDD	{0.4}	x	0.1	=	0.04
1,2,3,6,7,8-HxCDD	{0.4}	x	0.1	=	0.04
1,2,3,7,8,9-HxCDD	{0.3}	x	0.1	=	0.03
1,2,3,4,6,7,8-HpCDD	2.4	x	0.01	=	0.024
1,2,3,4,6,7,8,9-OCDD	56.2	x	0.001	=	0.0562
TOTAL PCDD					0.7
2,3,7,8-TCDF	{0.2}	x	0.1	=	0.02
1,2,3,7,8-PeCDF	{0.2}	x	0.05	=	0.01
2,3,4,7,8-PeCDF	{0.2}	x	0.5	=	0.1
1,2,3,4,7,8-HxCDF	{0.2}	x	0.1	=	0.02
1,2,3,6,7,8-HxCDF	{0.2}	x	0.1	=	0.02
2,3,4,6,7,8-HxCDF	{0.3}	x	0.1	=	0.03
1,2,3,7,8,9-HxCDF	{0.3}	x	0.1	=	0.03
1,2,3,4,6,7,8-HpCDF	{0.4}	x	0.01	=	0.004
1,2,3,4,7,8,9-HpCDF	{0.5}	x	0.01	=	0.005
1,2,3,4,6,7,8,9-OCDF	{1.2}	x	0.001	=	0.0012
TOTAL PCDF					0.2

Total EPA TEFs, 1989a: 0.9 pg/g

{...} indicates that the value is that of a Detection Limit.

GRY_TEF v1.08, MILES 4.22.16

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Phone: (919) 544-5729 • Fax: (919) 544-5491

Printed: 23:31 12/18/02

DATA VALIDATION WORKSHEET

Reviewer: Andrea
Date: 3/11/2003
DV Level: II III IV
Review Document:
_X_ SW-846 _X_ Project QAPP/SAP _X_ Region III

Dioxins and Furans Analysis

Project Name: Radford SWMU 54
Project Number: 15291524.00000
Laboratory: Triangle
SDG No.: 59113H
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?		x	
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Does sample preservation, collection and storage meet method requirement?	x		

Notes: cooler 4C
54SB55A and 54SB48A that are on COC can be found in SDG 59113, appear to be grouped by necessity of second column confirmation for TCDF
54SB55B
54SB48B

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method?	x		
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-).		x	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		x	

Notes: sampled 12/9/02
extracted 12/12/02
analyzed 12/18/02

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared at the appropriate frequency?	x		
3.2	Do any blanks have positive results? Action: If yes, an action level of 5 times the blank value is used to qualify sample results "U".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.			x

Notes:

4.0 Instrument Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply R.	x		
	For initial Calibration: for %RSD > ± 15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).	x		
4.2	Was the CCV analyzed every 12 hours? If no, J(+)/UJ(-) all samples analzed after the last passing CCV.	x		
4.3	Are all target compound %RSDs or %Rs within ±20%? If not apply "R".	x		
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).	x		
4.4	Are all reference %RSDs or %Rs within ±30%? If not apply "R".	x		

Notes: ICAL 6/7/02 SF56072, six points, all ratios within limits, %RSD<15%; ass tune at >10000, peak valley at 13%

CCC S026379 12/18/02 1710, all ratios within limits, %D<20%, RT within limits, S/N 428:1; ass tune at >10000, peak valley at 15%

CCC S026393 12/19/02 0449, all ratios within limits, %D<20%, RT within limits, S/N 1667:1; ass tune at >10000, peak valley at 14%

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are Tuning forms present for each start of a twelve hour sequence? If not, apply "R".	x		

Notes: RTCHK S026380 12/18/02 1826

RS-100 S026381 12/18/02 1914

RTCHK S026394 12/19/02 0554

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			x
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			x
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			x
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			x
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?		X	
	If Yes, J(+) only.			

Notes:

8.0 Internal Standard and Clean-Up Standard Recovery		Yes	No	NA
8.1	Are standard recoveries for all samples within 40-135% for all samples? If no, apply R.	X		

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			x
9.2	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			x

Notes:

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Were all sample results within the calibrated range, if not apply J.	X		
10.2	For positives, are the ion ratios passing and signal to noise greater than 2.5? If not, contact Lab.	X		
10.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	X		

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is the percent completeness within the control limits? (Control limit 90%)	X		
11.1.1	Number of samples:			
11.1.2	Number of target compounds in each analysis:			
11.1.3	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness =			

Notes:

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1048

Project Number	Project Name
3604-310	FTUF

Project Contact (Name and Phone Number): Parker Tomas

Samplers: Field Samplers

Field Sample ID	Date/Time (MM-DD-YY:HHMM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin Furan (8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54SB55A	12/6/02 1220	5		X	S	E		1							X								
54SB55B	12/6/02 1240	5		X	S	E		1							X								
54SB48A	12/6/02 1310	5		X	S	E		1							X								
54SB48B	12/6/02 1320	5		X	S	E		1							X								

Box #1 1. Surface Water 2. Ground Water 3. Leachate 4. Rinsate 5. Soil Sediment/Sludge 6. Trip Blank 7. Oil 8. Waste 9. Other ___

Box #2 A. HCl + Ice B. HNO_3 + Ice C. NaOH + Ice D. H_2SO_4 + Ice E. Unpreserved F. Ice Only G. Other ___ H. $NaHSO_4$ + Ice I. ZnAc + NaOH + Ice

Box #3 F. Filtered U. Unfiltered

Box #4 R. Rush - 3 Day S. Standard 28 Day T. Timely 14 Day O. Other ___

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
Beth L 12/9/02	1300				
Relinquished by:	Date/time	Received by: (for lab)	Date/Time		

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

LAB:

AIRBILL No:

Courier:

13

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by Dames & Moore is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

APPENDIX H.2
Additional Characterization Work Instructions Sampling
2004

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-17 **Fraction: Explosives, Nitroglycerin, Pesticides, Polychlorinated Biphenyls, & Metals**

Lab: TriMatrix **Project Name: Radford SWMU 54**

Reviewer: Andrea Sansom **Date: November 1, 2004**

This report presents the findings of a review of the referenced data. The report consists of this summary, a list of field samples submitted with this sample delivery group, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: For the explosive analyses, the following continuing calibrations displayed percent differences (%Ds) greater than the control limit (i.e., 15%):

Date	Time	Column	Analyte	%D	Bias
08/24/2004	0402	CN	Tetryl	20.3	-
08/24/2004	1528	C18	2,4-Dinitrotoluene	15.2	+
08/26/2004	1657	CN	Tetryl	15.3	-
08/26/2004	2234	CN	HMX	15.7	-
09/01/2004	1546	CN	Tetryl	15.3	-

For the CN column tetryl anomalies, no data qualifying action was taken for the associated field sample results that were non-detect on the C18 column since this column displayed acceptable %Ds. The positive tetryl result on the C18 column for field sample 54GW56 analyzed at a dilution factor of two was reported as non-detect because it was not confirmed on the alternate CN column. Since the CN column displayed a negative bias, this sample result was flagged "UJ,c". The associated field sample 2,4-dinitrotoluene results were non-detect while the continuing calibration displayed a positive bias. The associated HMX field sample result was positive and reported from the C18 column instead of the CN column that displayed the low bias anomaly. Therefore, no data qualifying action was taken.

The matrix spike pair performed on field sample 54GW56 displayed recoveries greater than the upper control limit of 150% for 4-amino-2,6-dinitrotoluene at 675% and 777%. The parent sample was non-detect, thus, no data qualifying action was taken. This matrix spike pair displayed acceptable recoveries (123%/140%) upon an analytical dilution factor of two and re-analysis. The diluted non-detect result for 4-amino-2,6-dinitrotoluene should be used for data interpretation.

The field duplicate pair 54GW59 and DUP-3 displayed a relative percent difference greater than the control limit of 25% for 2,4,6-trinitrotoluene at 89.5%. This field duplicate pair also displayed differences greater than the control limit of plus or minus two times the reporting limit for 4-amino-2,6-dinitrotoluene and octahydro-1,3,5,7-tetranitro-1,3,5,7-

tetrazocine. The parent sample displayed a statistically low surrogate recovery for 4-nitroaniline at 37%, although passing with a recovery greater than the lower control limit of 30%. These parent sample results are negatively biased; therefore, associated positive parent sample results were flagged "L,f" while the non-detect result was flagged "UL,f". The field duplicate pair 54GW64 and DUP-9 displayed acceptable precision.

Several positive field sample results displayed %Ds greater than the control limit of 40% between the two analytical column concentrations. These results were flagged "J,g". The concentration of 2,4,6-trinitrotoluene reported for field sample 54GW56 was above the linear range of the initial calibration. This result was flagged "J,q". The diluted analytical result for this compound should be used for data interpretation.

For the nitroglycerin analyses, the continuing calibrations analyzed on 08/30/2004 at 0833 and at 1132 displayed %Ds greater than the control limit (i.e., 15%) with a positive bias at 15.3% and 15.1%, respectively. The associated field sample results were non-detect, thus, no data qualifying action was required.

The matrix spike pair performed on field sample 54GW56 displayed recoveries outside the control limits for nitroglycerin with recoveries exceeding 1000% on the primary column and 0% recoveries on the alternate column. The laboratory cites interference from an adjacent peak identified as 2,4,6-trinitrotoluene. The sample was analyzed at a dilution factor of twenty along with a set of post digestion spikes. The post digestion spike recoveries were acceptable at 118% and 127% on the primary column. The laboratory reported results for this sample from the dilution. As per the laboratory, 2,4,6-trinitrotoluene did not interfere with the other field sample results for nitroglycerin due primarily to the less concentrated levels of interferent present. Most of the field sample extracts required a confirmation analyses on the alternate column due to a positive detection on the primary column. Upon analysis on the alternate column, no peak was identified and nitroglycerin was reported as non-detect. The data user should use these non-detect results with caution.

For the pesticides analysis, the initial calibration verification displayed a %D greater than the control limit of 15% for the co-elution of d-BHC and heptachlor on the rear column at 18.9%. Since the associated field samples were non-detect on the front column, no data qualifying action was required. The closing continuing calibration displayed %Ds greater than the control limit of 15% for 4,4'-DDD on the front column with a negative bias at 16.8% and for the co-elution of d-BHC and heptachlor on the rear column with a positive bias at 17.6%. The associated field samples were non-detect for these compounds on the alternate column that displayed passing %Ds, thus, no data qualifying action was required. The opening and closing DDT breakdown standards displayed percent breakdowns greater than the control limit of 15% on the rear column at 15.20% and 20.21%, respectively. Since the associated field sample results were non-detect for 4,4'-DDT, 4,4'-DDE, and 4,4'DDD, no data qualifying action was necessary.

For the metals analyses, the instrument initial and/or continuing calibration blanks displayed negative estimate detections for magnesium, manganese, potassium, sodium, and zinc. The associated positive field sample result was less than five times the absolute value of the negative blank detection for zinc and was flagged "L,o". All other associated field sample results were non-detect and were flagged "UL,o". The initial calibration blank displayed a positive estimate detection for antimony at 0.78 ug/L. The associated positive field sample result was less than five times the blank concentration and was flagged "B,o".

The method blanks displayed the following detections:

Batch	Analyte	Concentration (ug/L)
98708-127	Total Manganese	-4.056
98709-127	Dissolved Manganese	-4.799
98744-127	Antimony	1.34
	Chromium	0.28

The manganese and antimony method blank detections were attributed to instrument drift; therefore, no data qualifying action was taken based on these detections. The associated positive field sample result for chromium was less than five times the blank concentration and was flagged "B,p".

Several coolers containing field samples 54MW1, 54MW6 and MWEQB-5 for metals analyses and 54GW56, 54GW56MS, 54GW56MSD, 54GW57, 54GW58, 54GW59, 54GW60, 54GW61, 54GW62, 54GW63, 54GW66, 54GW67, 54GW69, and DUP-3 for explosives analysis were received by the laboratory with temperatures less than the lower control limit of 2.0°C at 1.9°C, 1.8°C, 1.9°C, 1.1°C, 1.1°C, 0.8°C, and 1.3°C. Since the containers were received intact and aliquots were not frozen, no impact on data quality was anticipated and no data qualifying action was taken.

The cooler containing field samples 54GW65, 54GW66, 54GW68, and 54GW70 for explosives analysis was received by the laboratory at a temperature greater than the upper control limit of 6.0°C at 8.9°C. Since these temperatures were less than 10°C, no impact on data quality objectives was anticipated and no data qualifying action was taken.

The cooler containing the field sample EQB-4 for pesticides and polychlorinated biphenyls analyses was received by the laboratory at a temperature greater than the upper control limit at 11.3°C. Since the equipment blank frequency of collection was one per day, recollection of this sample was not possible. All sample results were non-detect and were flagged "UJ,k". The field samples 54GW66, 54GW67, and 54GW69 collected on 08/20/2004 and submitted for explosives analyses were received by the laboratory with a cooler temperature of 14.6°C. These aliquots were discarded and the sample points were re-collected on 08/23/2004.

Correctable Anomalies: The chain of custody and the sample container label had different collection times for sample 54MW1. As directed by the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.

Comments: One of the twelve liter amber bottles was received broken by the laboratory for field sample 54GW56 that was assigned as a parent sample for matrix spike analyses. Sufficient volume remained for the laboratory to complete the requested parameters. No anomalies were encountered if a given fraction was not mentioned. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SWMU54
36440-17

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
368215	EQB-1	8/17/2004	Explosives, Pesticides, PCBs, & Metals
368216	54GW57	8/17/2004	Explosives
368217	54GW56	8/18/2004	Explosives (MS/MSD)
368218	54GW59	8/18/2004	Explosives
368236	DUP-3	8/18/2004	Explosives
368329	EQB-2	8/18/2004	Explosives, Pesticides, PCBs, & Metals
368330	EQB-3	8/19/2004	Explosives, Pesticides, PCBs, & Metals
368626	54GW70	8/20/2004	Explosives
368627	54GW68	8/20/2004	Explosives
368628	54GW65	8/20/2004	Explosives
368629	EQB-4	8/20/2004	Pesticides & PCBs
368726	54GW67	8/23/2004	Explosives
368727	54GW66	8/23/2004	Explosives
368728	54GW69	8/23/2004	Explosives
368729	54GW64	8/23/2004	Explosives
368730	54GW63	8/23/2004	Explosives
368731	DUP-9	8/23/2004	Explosives
368843	54GW61	8/24/2004	Explosives
368844	54MW1	8/24/2004	Metals (MS/MSD)
368845	54GW62	8/23/2004	Explosives
368846	54GW60	8/24/2004	Explosives
368847	54GW58	8/24/2004	Explosives
368962	54MW6	8/25/2004	Metals
368963	MWEQB-5	8/25/2004	Metals

Radford Army Ammunitions Plant
SWMU54
Duplicate Statistics

54GW59 and DUP-3

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	2xRL	Pass /Fail
Explosives									
2,4,6-trinitrotoluene	µg/L	0.65	3.3	4.2	11	**89.5%**	6.8	1.3	**Fail**
2-amino-4,6-dinitrotoluene	µg/L	1.0	5.0	1.4	3.0	72.7%	**1.6**	2.0	Pass
4-amino-2,6-dinitrotoluene	µg/L	1.0	5.0	1.0 U	3.6	113.0%	**2.6**	2.0	**Fail**
octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	µg/L	1.0	5.0	1.1	4.1	115.4%	**3.0**	2.0	**Fail**
hexahydro-1,3,5-trinitro-1,3,5-triazine	µg/L	0.65	3.3	1.0	1.7	51.9%	**0.7**	1.3	Pass

Aqueous Control Limits

[sample] > 5 x RL, use 25%
[sample] < 5 x RL, use 2 x RL

Radford Army Ammunitions Plant
SWMU54
Duplicate Statistics

54GW64 and DUP-9

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	2xRL	Pass /Fail
Explosives									
2,4,6-trinitrotoluene	µg/L	0.65	3.3	0.82	0.76	7.6%	**0.06**	1.3	Pass
2-amino-4,6-dinitrotoluene	µg/L	1.0	5.0	0.40 J	0.47 J	16.1%	**0.07**	2.0	Pass
octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	µg/L	1.0	5.0	5.5	5.6	**1.8%**	0.1	2.0	Pass
hexahydro-1,3,5-trinitro-1,3,5-triazine	µg/L	0.65	3.3	0.75	0.73	2.7%	**0.02**	1.3	Pass

Aqueous Control Limits

[sample] > 5 x RL, use 25%
[sample] < 5 x RL, use 2 x RL

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 20:10
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 09:00
Submittal #:	**36440-17**	Prepared:	08/19/04 by DJM
Submittal:	ERB & GW, Aug 17-25, 2004 RFAAP SWMU 54	Prep. Method:	USEPA-8330
		Analyzed:	08/20/04 by JMK1
Sample ID:	**EQB-1**	Anal. Method:	USEPA-8330
Sample #:	**368215**	QC Batch:	98595 -119
Matrix:	QC Water	Anal. Batch:	220866
Unit:	ug/L	Percent Solids:	n/a
		Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 20:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/19/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/20/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW57**	QC Batch:	98595 -119
Sample #:	**368216**	Anal. Batch:	220866
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**1.7** J,g	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**4.3**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**0.69**	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 12:15
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 09:00
		Prepared:	08/19/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004 RFAAP SWMU 54	Analyzed:	09/01/04 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**54GW56**	QC Batch:	98595 -119
Sample #:	**368217**	Anal. Batch:	221040
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL	
99-35-4	**1,3,5-Trinitrobenzene**	**32**		0.65	0.158	
99-65-0	1,3-Dinitrobenzene	1.0 U		1.0	0.230	
~~118-96-7~~	~~*2,4,6-Trinitrotoluene~~	~~140 E~~	J, q	0.65	0.0749	See dilution ltr 11/3/04
121-14-2	2,4-Dinitrotoluene	0.65 U		0.65	0.122	
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.267	
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**8.7**		1.0	0.200	
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.263	
99-08-1	3-Nitrotoluene	2.0 U		2.0	0.218	
~~1946-51-0~~	~~*4-Amino-2,6-dinitro-toluene~~	~~1.0 U~~		~~1.0~~	~~0.314~~	See dilution ltr 11/3/04
99-99-0	4-Nitrotoluene	2.0 U		2.0	0.146	
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**9.4**		1.0	0.250	
98-95-3	Nitrobenzene	0.65 U		0.65	0.0579	
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**35**	J, q	0.65	0.164	
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U		2.0	0.180	

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 12:15
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 09:00
		Prepared:	08/19/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004 RFAAP SWMU 54	Analyzed:	09/01/04 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**54GW56**	QC Batch:	98595 -119
Sample #:	**368217DL**	Anal. Batch:	220910
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	2

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	**1,3,5-Trinitrobenzene**	**36**		1.3	0.316
99-65-0	1,3-Dinitrobenzene	2.0 U		2.0	0.460
118-96-7	**2,4,6-Trinitrotoluene**	**160**		1.3	0.150
121-14-2	2,4-Dinitrotoluene	1.3 U		1.3	0.244
606-20-2	2,6-Dinitrotoluene	2.0 U		2.0	0.534
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**12**		2.0	0.400
88-72-2	2-Nitrotoluene	2.0 U		2.0	0.526
99-08-1	3-Nitrotoluene	4.0 U		4.0	0.436
1946-51-0	4-Amino-2,6-dinitro-toluene	2.0 U		2.0	0.628
99-99-0	4-Nitrotoluene	4.0 U		4.0	0.292
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**10**		2.0	0.500
98-95-3	Nitrobenzene	1.3 U		1.3	0.116
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**42**		1.3	0.328
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	4.0 U	UJc	4.0	0.360

USe only results for 2,4,6-TNT and 4-A-2,6-DNT, ~~JS~~ 11/03/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/19/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/20/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW59**	QC Batch:	98595 -119
Sample #:	**368218**	Anal. Batch:	220866
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U		0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U		1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**4.2**	L,f	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U		0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**1.4**		1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U		2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	UL,f	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U		2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**1.1**	L,f	1.0	0.250
98-95-3	Nitrobenzene	0.65 U		0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**1.0**		0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U		2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/19/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/20/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**DUP-3**	QC Batch:	98595 -119
Sample #:	**368236**	Anal. Batch:	220866
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**11** J,g	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**3.0**	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	**4-Amino-2,6-dinitro-toluene**	**3.6**	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**4.1**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**1.7**	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 19:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/23/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/24/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**EQB-2**	QC Batch:	98595 -123
Sample #:	**368329**	Anal. Batch:	220816
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/23/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/24/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**EQB-3**	QC Batch:	98595 -123
Sample #:	**368330**	Anal. Batch:	220816
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 12:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW70**	QC Batch:	98595 -125
Sample #:	**368626**	Anal. Batch:	220739
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**9.7**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Submittal #: **36440-17**
Submittal: ERB & GW, Aug 17-25, 2004
RFAAP SWMU 54
Sample ID: **54GW68**
Sample #: **368627**
Matrix: Ground Water
Unit: ug/L

Sampled: 08/20/04 @ 13:15
Sampler: D. Copen
Received: 08/21/04 @ 09:10
Prepared: 08/25/04 by DJM
Prep. Method: USEPA-8330
Analyzed: 08/26/04 by JMK1
Anal. Method: USEPA-8330
QC Batch: 98595 -125
Anal. Batch: 220739
Percent Solids: n/a
Dilution Factor: 1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**2.6** J,g	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**0.78 J**	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**5.1**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW65**	QC Batch:	98595 -125
Sample #:	**368628**	Anal. Batch:	220739
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**3.0**	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**1.3**	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**6.1**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**0.70**	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 14:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW67**	QC Batch:	98595 -125
Sample #:	**368726**	Anal. Batch:	220739
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**3.7**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 14:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW66**	QC Batch:	98595 -125
Sample #:	**368727**	Anal. Batch:	220739
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**2.5**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 14:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW69**	QC Batch:	98595 -125
Sample #:	**368728**	Anal. Batch:	220739
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**1.4**	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**0.66 J**	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**5.2**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**0.51 J**	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW64**	QC Batch:	98595 -125
Sample #:	**368729**	Anal. Batch:	220739
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U		0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U		1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**0.82**	J,q	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U		0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**0.40 J**		1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U		2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U		1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U		2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**5.5**		1.0	0.250
98-95-3	Nitrobenzene	0.65 U		0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**0.75**	J,q	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U		2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 15:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW63**	QC Batch:	98595 -125
Sample #:	**368730**	Anal. Batch:	220739
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	**4-Nitrotoluene**	**0.34 J** J, g	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**1.0**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**DUP-9**	QC Batch:	98595 -125
Sample #:	**368731**	Anal. Batch:	220739
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U		0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U		1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**0.76**	J,g	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U		0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**0.47 J**	J,g	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U		2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U		1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U		2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**5.6**		1.0	0.250
98-95-3	Nitrobenzene	0.65 U		0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**0.73**	J,g	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U		2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/24/04 @ 12:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/25/04 @ 08:45
		Prepared:	08/26/04 by ASC
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/28/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW61**	QC Batch:	98595 -126
Sample #:	**368843**	Anal. Batch:	221041
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	**1,3,5-Trinitrobenzene**	**3.4**	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**74**	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**7.1**	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**9.7**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 16:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/25/04 @ 08:45
		Prepared:	08/26/04 by ASC
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/28/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW62**	QC Batch:	98595 -126
Sample #:	**368845**	Anal. Batch:	221041
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	**1,3,5-Trinitrobenzene**	**2.2** J,g	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**9.0**	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**3.2**	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**6.6**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**1.6**	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/24/04 @ 11:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/25/04 @ 08:45
		Prepared:	08/26/04 by ASC
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/28/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW60**	QC Batch:	98595 -126
Sample #:	**368846**	Anal. Batch:	221041
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**9.3**	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**3.8**	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**4.6**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**0.80**	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/24/04 @ 11:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/25/04 @ 08:45
		Prepared:	08/26/04 by ASC
Submittal #:	**36440-17**	Prep. Method:	USEPA-8330
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/28/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54GW58**	QC Batch:	98595 -126
Sample #:	**368847**	Anal. Batch:	221041
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	**1,3,5-Trinitrobenzene**	**9.2**	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	**2,4,6-Trinitrotoluene**	**15**	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**7.5**	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**9.5**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**3.7**	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 20:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/19/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/22/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**EQB-1**	QC Batch:	98624 -119
Sample #:	**368215**	Anal. Batch:	220774
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000805

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 20:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/19/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/22/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW57**	QC Batch:	98624 -119
Sample #:	**368216**	Anal. Batch:	220774
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	1.18

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 12:15
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 09:00
		Prepared:	08/19/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004 RFAAP SWMU 54	Analyzed:	09/08/04 by JMK1
		Anal. Method:	USEPA-8332
Sample ID:	**54GW56**	QC Batch:	98624 -119
Sample #:	**368217**	Anal. Batch:	221184
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	20

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	40 U	40	11.8

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/19/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/22/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW59**	QC Batch:	98624 -119
Sample #:	**368218**	Anal. Batch:	220774
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	1.18

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/19/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/22/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**DUP-3**	QC Batch:	98624 -119
Sample #:	**368236**	Anal. Batch:	220774
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000809

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 19:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/20/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/22/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**EQB-2**	QC Batch:	98624 -120
Sample #:	**368329**	Anal. Batch:	220774
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000810

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/20/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/22/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**EQB-3**	QC Batch:	98624 -120
Sample #:	**368330**	Anal. Batch:	220774
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 12:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/30/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW70**	QC Batch:	98624 -125
Sample #:	**368626**	Anal. Batch:	220861
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 13:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/30/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW68**	QC Batch:	98624 -125
Sample #:	**368627**	Anal. Batch:	220861
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/30/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW65**	QC Batch:	98624 -125
Sample #:	**368628**	Anal. Batch:	220861
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000814

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 14:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/30/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW67**	QC Batch:	98624 -125
Sample #:	**368726**	Anal. Batch:	220861
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 14:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/30/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW66**	QC Batch:	98624 -125
Sample #:	**368727**	Anal. Batch:	220861
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000816

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 14:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/30/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW69**	QC Batch:	98624 -125
Sample #:	**368728**	Anal. Batch:	220861
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000817

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/30/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW64**	QC Batch:	98624 -125
Sample #:	**368729**	Anal. Batch:	220861
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 15:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/30/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW63**	QC Batch:	98624 -125
Sample #:	**368730**	Anal. Batch:	220861
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000819

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/24/04 @ 08:30
		Prepared:	08/25/04 by DJM
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/30/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**DUP-9**	QC Batch:	98624 -125
Sample #:	**368731**	Anal. Batch:	220861
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000820

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/24/04 @ 12:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/25/04 @ 08:45
		Prepared:	08/26/04 by ASC
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW61**	QC Batch:	98624 -126
Sample #:	**368843**	Anal. Batch:	220854
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000821

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/23/04 @ 16:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/25/04 @ 08:45
		Prepared:	08/26/04 by ASC
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW62**	QC Batch:	98624 -126
Sample #:	**368845**	Anal. Batch:	220854
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000822

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/24/04 @ 11:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/25/04 @ 08:45
		Prepared:	08/26/04 by ASC
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW60**	QC Batch:	98624 -126
Sample #:	**368846**	Anal. Batch:	220854
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000823

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/24/04 @ 11:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/25/04 @ 08:45
		Prepared:	08/26/04 by ASC
Submittal #:	**36440-17**	Prep. Method:	USEPA-8332
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/28/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54GW58**	QC Batch:	98624 -126
Sample #:	**368847**	Anal. Batch:	220854
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000824

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 20:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by PAK
Submittal #:	**36440-17**	Prep. Method:	USEPA-3510C
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**EQB-1**	QC Batch:	98906 -124
Sample #:	**368215**	Anal. Batch:	221226
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	0.10 U	0.10	0.0047
72-55-9	4,4'-DDE	0.10 U	0.10	0.0058
50-29-3	4,4'-DDT	0.10 U	0.10	0.0044
309-00-2	Aldrin	0.050 U	0.050	0.0021
319-84-6	Alpha-BHC	0.050 U	0.050	0.0041
5103-71-9	A-Chlordane	0.050 U	0.050	0.0043
5103-74-2	G-Chlordane	0.050 U	0.050	0.0057
319-85-7	Beta-BHC	0.050 U	0.050	0.0076
319-86-8	Delta-BHC	0.050 U	0.050	0.0076
60-57-1	Dieldrin	0.10 U	0.10	0.0048
959-98-8	Endosulfan I	0.050 U	0.050	0.0038
33213-65-9	Endosulfan II	0.10 U	0.10	0.0028
1031-07-8	Endosulfan Sulfate	0.10 U	0.10	0.0064
72-20-8	Endrin	0.10 U	0.10	0.0055
7421-93-4	Endrin Aldehyde	0.10 U	0.10	0.0078
53494-70-5	Endrin Ketone	0.10 U	0.10	0.0057
58-89-9	Lindane	0.050 U	0.050	0.0038
76-44-8	Heptachlor	0.050 U	0.050	0.0047
1024-57-3	Heptachlor Epoxide	0.050 U	0.050	0.0046
72-43-5	Methoxychlor	0.50 U	0.50	0.0079
8001-35-2	Toxaphene	1.0 U	1.0	0.0723

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 19:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/24/04 by PAK
Submittal #:	**36440-17**	Prep. Method:	USEPA-3510C
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**EQB-2**	QC Batch:	98906 -124
Sample #:	**368329**	Anal. Batch:	221226
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	0.10 U	0.10	0.0047
72-55-9	4,4'-DDE	0.10 U	0.10	0.0058
50-29-3	4,4'-DDT	0.10 U	0.10	0.0044
309-00-2	Aldrin	0.050 U	0.050	0.0021
319-84-6	Alpha-BHC	0.050 U	0.050	0.0041
5103-71-9	A-Chlordane	0.050 U	0.050	0.0043
5103-74-2	G-Chlordane	0.050 U	0.050	0.0057
319-85-7	Beta-BHC	0.050 U	0.050	0.0076
319-86-8	Delta-BHC	0.050 U	0.050	0.0076
60-57-1	Dieldrin	0.10 U	0.10	0.0048
959-98-8	Endosulfan I	0.050 U	0.050	0.0038
33213-65-9	Endosulfan II	0.10 U	0.10	0.0028
1031-07-8	Endosulfan Sulfate	0.10 U	0.10	0.0064
72-20-8	Endrin	0.10 U	0.10	0.0055
7421-93-4	Endrin Aldehyde	0.10 U	0.10	0.0078
53494-70-5	Endrin Ketone	0.10 U	0.10	0.0057
58-89-9	Lindane	0.050 U	0.050	0.0038
76-44-8	Heptachlor	0.050 U	0.050	0.0047
1024-57-3	Heptachlor Epoxide	0.050 U	0.050	0.0046
72-43-5	Methoxychlor	0.50 U	0.50	0.0079
8001-35-2	Toxaphene	1.0 U	1.0	0.0723

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001098

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/24/04 by PAK
Submittal #:	**36440-17**	Prep. Method:	USEPA-3510C
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**EQB-3**	QC Batch:	98906 -124
Sample #:	**368330**	Anal. Batch:	221226
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	0.10 U	0.10	0.0047
72-55-9	4,4'-DDE	0.10 U	0.10	0.0058
50-29-3	4,4'-DDT	0.10 U	0.10	0.0044
309-00-2	Aldrin	0.050 U	0.050	0.0021
319-84-6	Alpha-BHC	0.050 U	0.050	0.0041
5103-71-9	A-Chlordane	0.050 U	0.050	0.0043
5103-74-2	G-Chlordane	0.050 U	0.050	0.0057
319-85-7	Beta-BHC	0.050 U	0.050	0.0076
319-86-8	Delta-BHC	0.050 U	0.050	0.0076
60-57-1	Dieldrin	0.10 U	0.10	0.0048
959-98-8	Endosulfan I	0.050 U	0.050	0.0038
33213-65-9	Endosulfan II	0.10 U	0.10	0.0028
1031-07-8	Endosulfan Sulfate	0.10 U	0.10	0.0064
72-20-8	Endrin	0.10 U	0.10	0.0055
7421-93-4	Endrin Aldehyde	0.10 U	0.10	0.0078
53494-70-5	Endrin Ketone	0.10 U	0.10	0.0057
58-89-9	Lindane	0.050 U	0.050	0.0038
76-44-8	Heptachlor	0.050 U	0.050	0.0047
1024-57-3	Heptachlor Epoxide	0.050 U	0.050	0.0046
72-43-5	Methoxychlor	0.50 U	0.50	0.0079
8001-35-2	Toxaphene	1.0 U	1.0	0.0723

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/24/04 by PAK
Submittal #:	**36440-17**	Prep. Method:	USEPA-3510C
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**EQB-4**	QC Batch:	98906 -124
Sample #:	**368629**	Anal. Batch:	221226
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	0.10 U	UJ,k	0.10	0.0047
72-55-9	4,4'-DDE	0.10 U		0.10	0.0058
50-29-3	4,4'-DDT	0.10 U		0.10	0.0044
309-00-2	Aldrin	0.050 U		0.050	0.0021
319-84-6	Alpha-BHC	0.050 U		0.050	0.0041
5103-71-9	A-Chlordane	0.050 U		0.050	0.0043
5103-74-2	G-Chlordane	0.050 U		0.050	0.0057
319-85-7	Beta-BHC	0.050 U		0.050	0.0076
319-86-8	Delta-BHC	0.050 U		0.050	0.0076
60-57-1	Dieldrin	0.10 U		0.10	0.0048
959-98-8	Endosulfan I	0.050 U		0.050	0.0038
33213-65-9	Endosulfan II	0.10 U		0.10	0.0028
1031-07-8	Endosulfan Sulfate	0.10 U		0.10	0.0064
72-20-8	Endrin	0.10 U		0.10	0.0055
7421-93-4	Endrin Aldehyde	0.10 U		0.10	0.0078
53494-70-5	Endrin Ketone	0.10 U		0.10	0.0057
58-89-9	Lindane	0.050 U		0.050	0.0038
76-44-8	Heptachlor	0.050 U		0.050	0.0047
1024-57-3	Heptachlor Epoxide	0.050 U		0.050	0.0046
72-43-5	Methoxychlor	0.50 U		0.50	0.0079
8001-35-2	Toxaphene	1.0 U		1.0	0.0723

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 20:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by PAK
Submittal #:	**36440-17**	Prep. Method:	USEPA-3510C
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**EQB-1**	QC Batch:	98522 -124
Sample #:	**368215**	Anal. Batch:	220619
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Polychlorinated Biphenyls OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	0.20 U	0.20	0.0509
11104-28-2	PCB-1221	0.20 U	0.20	0.0543
11141-16-5	PCB-1232	0.20 U	0.20	0.0538
53469-21-9	PCB-1242	0.20 U	0.20	0.0366
12672-29-6	PCB-1248	0.20 U	0.20	0.0381
11097-69-1	PCB-1254	0.20 U	0.20	0.0406
11096-82-5	PCB-1260	0.20 U	0.20	0.0535

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 19:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/24/04 by PAK
Submittal #:	**36440-17**	Prep. Method:	USEPA-3510C
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**EQB-2**	QC Batch:	98522 -124
Sample #:	**368329**	Anal. Batch:	220619
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Polychlorinated Biphenyls OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	0.20 U	0.20	0.0509
11104-28-2	PCB-1221	0.20 U	0.20	0.0543
11141-16-5	PCB-1232	0.20 U	0.20	0.0538
53469-21-9	PCB-1242	0.20 U	0.20	0.0366
12672-29-6	PCB-1248	0.20 U	0.20	0.0381
11097-69-1	PCB-1254	0.20 U	0.20	0.0406
11096-82-5	PCB-1260	0.20 U	0.20	0.0535

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/24/04 by PAK
Submittal #:	**36440-17**	Prep. Method:	USEPA-3510C
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**EQB-3**	QC Batch:	98522 -124
Sample #:	**368330**	Anal. Batch:	220619
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Polychlorinated Biphenyls OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	0.20 U	0.20	0.0509
11104-28-2	PCB-1221	0.20 U	0.20	0.0543
11141-16-5	PCB-1232	0.20 U	0.20	0.0538
53469-21-9	PCB-1242	0.20 U	0.20	0.0366
12672-29-6	PCB-1248	0.20 U	0.20	0.0381
11097-69-1	PCB-1254	0.20 U	0.20	0.0406
11096-82-5	PCB-1260	0.20 U	0.20	0.0535

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/24/04 by PAK
Submittal #:	**36440-17**	Prep. Method:	USEPA-3510C
Submittal:	ERB & GW, Aug 17-25, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**EQB-4**	QC Batch:	98522 -124
Sample #:	**368629**	Anal. Batch:	220619
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Polychlorinated Biphenyls OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	0.20 U UJ,K	0.20	0.0509
11104-28-2	PCB-1221	0.20 U	0.20	0.0543
11141-16-5	PCB-1232	0.20 U	0.20	0.0538
53469-21-9	PCB-1242	0.20 U	0.20	0.0366
12672-29-6	PCB-1248	0.20 U	0.20	0.0381
11097-69-1	PCB-1254	0.20 U	0.20	0.0406
11096-82-5	PCB-1260	0.20 U	0.20	0.0535

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 20:10
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-17**
Submittal: ERB & GW, Aug 17-25, 2004
RFAAP SWMU 54
Sample ID: **EQB-1**
Sample #: **368215**
Matrix: QC Water

Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	200 U	200	41.1	ug/L	09/01/04	DSC	EPA-200.7/6010B
Antimony, Total 0.986	0.99 J	5.0	0.682 B,O	ug/L	09/01/04	DWJ	EPA-200.8/6020
Arsenic, Total	1.0 U	1.0	0.209	ug/L	09/01/04	DWJ	EPA-200.8/6020
Barium, Total	20 U	20	4.69	ug/L	09/01/04	DSC	EPA-200.7/6010B
Beryllium, Total	4.0 U	4.0	0.270	ug/L	09/01/04	DSC	EPA-200.7/6010B
Cadmium, Total	0.5 U	0.5	0.0568	ug/L	09/01/04	DWJ	EPA-200.8/6020
Calcium, Total	500 U	500	46.4	ug/L	09/01/04	DSC	EPA-200.7/6010B
Chromium, Total	5.0 U	5.0	0.261	ug/L	09/01/04	DWJ	EPA-200.8/6020
Cobalt, Total	10 U	10	2.58	ug/L	09/01/04	DSC	EPA-200.7/6010B
Copper, Total	20 U	20	6.60	ug/L	09/01/04	DSC	EPA-200.7/6010B
Iron, Total 13.93	14 J	100	7.72	ug/L	09/01/04	DSC	EPA-200.7/6010B
Lead, Total	1.0 U	1.0	0.231	ug/L	09/01/04	DWJ	EPA-200.8/6020
Magnesium, Total	500 U	500	63.5 UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Manganese, Total -3.081	10 U	10	1.64 UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Mercury, Total	0.4 U	0.4	0.0584	ug/L	09/01/04	KLVM	USEPA-7470A
Nickel, Total	1.0 U	1.0	0.230	ug/L	09/01/04	DWJ	EPA-200.8/6020
Potassium, Total	500 U	500	51.5 UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Selenium, Total	2.0 U	2.0	0.249	ug/L	09/01/04	DWJ	EPA-200.8/6020
Silver, Total	0.5 U	0.5	0.0631	ug/L	09/01/04	DWJ	EPA-200.8/6020
Sodium, Total	700 U	700	231 UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Thallium, Total	1.0 U	1.0	0.0410	ug/L	09/01/04	DWJ	EPA-200.8/6020
Vanadium, Total	25 U	25	7.93	ug/L	09/01/04	DSC	EPA-200.7/6010B
Zinc, Total	20 U	20	4.44 UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B

000108

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 19:30
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-17**
Submittal: ERB & GW, Aug 17-25, 2004
RFAAP SWMU 54
Sample ID: **EQB-2**
Sample #: **368329**
Matrix: QC Water

Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL		Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	200 U	200	41.1		ug/L	09/01/04	DSC	EPA-200.7/6010B
Antimony, Total	5.0 U	5.0	0.682		ug/L	09/01/04	DWJ	EPA-200.8/6020
Arsenic, Total	1.0 U	1.0	0.209		ug/L	09/01/04	DWJ	EPA-200.8/6020
Barium, Total	20 U	20	4.69		ug/L	09/01/04	DSC	EPA-200.7/6010B
Beryllium, Total	4.0 U	4.0	0.270		ug/L	09/01/04	DSC	EPA-200.7/6010B
Cadmium, Total	0.5 U	0.5	0.0568		ug/L	09/01/04	DWJ	EPA-200.8/6020
Calcium, Total	500 U	500	46.4		ug/L	09/01/04	DSC	EPA-200.7/6010B
Chromium, Total	5.0 U	5.0	0.261		ug/L	09/01/04	DWJ	EPA-200.8/6020
Cobalt, Total	10 U	10	2.58		ug/L	09/01/04	DSC	EPA-200.7/6010B
Copper, Total	20 U	20	6.60		ug/L	09/01/04	DSC	EPA-200.7/6010B
Iron, Total	100 U	100	7.72		ug/L	09/01/04	DSC	EPA-200.7/6010B
Lead, Total	1.0 U	1.0	0.231		ug/L	09/01/04	DWJ	EPA-200.8/6020
Magnesium, Total	500 U	500	63.5	UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Manganese, Total - 4.64	10 U	10	1.64	UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Mercury, Total	0.4 U	0.4	0.0584		ug/L	09/01/04	KLVM	USEPA-7470A
Nickel, Total	1.0 U	1.0	0.230		ug/L	09/01/04	DWJ	EPA-200.8/6020
Potassium, Total	500 U	500	51.5	UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Selenium, Total	2.0 U	2.0	0.249		ug/L	09/01/04	DWJ	EPA-200.8/6020
Silver, Total	0.5 U	0.5	0.0631		ug/L	09/01/04	DWJ	EPA-200.8/6020
Sodium, Total	700 U	700	231	UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Thallium, Total	1.0 U	1.0	0.0410		ug/L	09/01/04	DWJ	EPA-200.8/6020
Vanadium, Total	25 U	25	7.93		ug/L	09/01/04	DSC	EPA-200.7/6010B
Zinc, Total	20 U	20	4.44	UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B

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000109

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 15:55
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-17**
Submittal: ERB & GW, Aug 17-25, 2004
RFAAP SWMU 54
Sample ID: **EQB-3**
Sample #: **368330**
Matrix: QC Water

Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL		Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	200 U	200	41.1		ug/L	09/01/04	DSC	EPA-200.7/6010B
Antimony, Total	5.0 U	5.0	0.682		ug/L	09/01/04	DWJ	EPA-200.8/6020
Arsenic, Total	1.0 U	1.0	0.209		ug/L	09/01/04	DWJ	EPA-200.8/6020
Barium, Total	20 U	20	4.69		ug/L	09/01/04	DSC	EPA-200.7/6010B
Beryllium, Total	4.0 U	4.0	0.270		ug/L	09/01/04	DSC	EPA-200.7/6010B
Cadmium, Total	0.5 U	0.5	0.0568		ug/L	09/01/04	DWJ	EPA-200.8/6020
Calcium, Total	500 U	500	46.4		ug/L	09/01/04	DSC	EPA-200.7/6010B
Chromium, Total 0.314	0.3 J	5.0	0.261	B,P	ug/L	09/01/04	DWJ	EPA-200.8/6020
Cobalt, Total	10 U	10	2.58		ug/L	09/01/04	DSC	EPA-200.7/6010B
Copper, Total	20 U	20	6.60		ug/L	09/01/04	DSC	EPA-200.7/6010B
Iron, Total 9.478	9 J	100	7.72		ug/L	09/01/04	DSC	EPA-200.7/6010B
Lead, Total	1.0 U	1.0	0.231		ug/L	09/01/04	DWJ	EPA-200.8/6020
Magnesium, Total	500 U	500	63.5	UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Manganese, Total	10 U	10	1.64	UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Mercury, Total	0.4 U	0.4	0.0584		ug/L	09/01/04	KLVM	USEPA-7470A
Nickel, Total	1.0 U	1.0	0.230		ug/L	09/01/04	DWJ	EPA-200.8/6020
Potassium, Total	500 U	500	51.5	UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Selenium, Total	2.0 U	2.0	0.249		ug/L	09/01/04	DWJ	EPA-200.8/6020
Silver, Total	0.5 U	0.5	0.0631		ug/L	09/01/04	DWJ	EPA-200.8/6020
Sodium, Total	700 U	700	231	UL,O	ug/L	09/01/04	DSC	EPA-200.7/6010B
Thallium, Total	1.0 U	1.0	0.0410		ug/L	09/01/04	DWJ	EPA-200.8/6020
Vanadium, Total	25 U	25	7.93		ug/L	09/01/04	DSC	EPA-200.7/6010B
Zinc, Total 7.216	7 J	20	4.44	L,O	ug/L	09/01/04	DSC	EPA-200.7/6010B

000110

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/24/04 @ 17:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/25/04 @ 08:45

Submittal #: **36440-17**
Submittal: ERB & GW, Aug 17-25, 2004
RFAAP SWMU 54
Sample ID: **54MW1**
Sample #: **368844**
Matrix: Ground Water Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	10 U	10	1.64	VL,6 ug/L	09/01/04	DSC	EPA-200.7/6010B
Manganese, Dissolved	10 U	10	1.64	VL10 ug/L	09/01/04	DSC	EPA-200.7/6010B

000111

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/25/04 @ 16:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/26/04 @ 09:10

Submittal #: **36440-17**
Submittal: ERB & GW, Aug 17-25, 2004
RFAAP SWMU 54
Sample ID: **54MW6**
Sample #: **368962**
Matrix: Ground Water Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL		Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	41	10	1.64		ug/L	09/01/04	DSC	EPA-200.7/6010B
Manganese, Dissolved	2 J	10	1.64	L,O	ug/L	09/01/04	DSC	EPA-200.7/6010B

000112

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/25/04 @ 17:30
Sampler: D. Copen
Received: 08/26/04 @ 09:10

Submittal #: **36440-17**
Submittal: ERB & GW, Aug 17-25, 2004
RFAAP SWMU 54
Sample ID: **MWEQB-5**
Sample #: **368963**
Matrix: QC Water

Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	10 U	10	1.64	UL, o ug/L	09/01/04	DSC	EPA-200.7/6010B
Manganese, Dissolved	10 U	10	1.64	UL, o ug/L	09/01/04	DSC	EPA-200.7/6010B

End of Analytical Report

000113

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DATA VALIDATION WORKSHEET

Explosives

Reviewer: Andrea Sansom
Date: 10/29/2004
DV Level: II III IV
Review Document:
_X_ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
_X_ Project QAPP/SAP

Project Name: Radford SWMU41
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-17
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids (for		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes: *One of the twelve liter amber bottles was received broken by the laboratory for field sample 54GW56 that was assigned as a parent sample for matrix spike analyses. Sufficient volume remained for the laboratory to complete the requested parameters.*

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		x	
	Action: If the temperature of the cooler was elevated (> 10 ℃), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes: *Field coolers exceed limits, <10C: no action.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			x

Notes: *EQB-1, EQB-2, and EQB-3 are associated with soil boring samples located in other SDGs, detections are essentially irrelevant to this report.*
All equipment used for GW samples was dedicated and/or disposable, no EQB required.

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		x	
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	x		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			x
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			x
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?	x		
6.4	Are there any RPD for MS/MSD recoveries outside the QC limits not to exceed 60%?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:	54GW56	MS	MSD	RPD	
	4-amino-2,6-dinitrotoluene (40-150%)	**675%**	**777%**	14%	***4-amino-2,6-dinitrotoluene displayed high recoveries due to interference by***
	-amino-2,6-dinitrotoluene DF2 (40-150%)	123%	140%	13%	***adjacent target analyte 2,4,6-TNT***
					4-amino-2,6-dinitrotoluene displayed acceptable recoveries upon dilution

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		x	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			x
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		x	

Notes: *54GW59 and DUP-3*

54GW64 and DUP-9

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	x		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.		x	
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	20			
	Number of target compounds in each analysis:	14			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: Andrea Sansom
Date: 10/29/2004
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU41
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-17
Test Name: Nitroglycerin
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids (for		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes: *One of the twelve liter amber bottles was received broken by the laboratory for field sample 54GW56 that was assigned as a parent sample for matrix spike analyses. Sufficient volume remained for the laboratory to complete the requested parameters.*

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		x	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	x		
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes: *Field coolers exceed limits, <10C: no action.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			x

Notes: *EQB-1, EQB-2, and EQB-3 are associated with soil boring samples located in other SDGs, detections are essentially irrelevant to this report. All equipment used for GW samples was dedicated and/or disposable, no EQB required.*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		x	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	x		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			x
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			x
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		x	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: *54GW56* ***Nitroglycerin displayed high recoveries due to interference by the adjacent non-target analyte 2,4,6-TNT***

Nitroglycerin displayed acceptable post spike recoveries upon dilution

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		x	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			x
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes: *54GW59 and DUP-3*

54GW64 and DUP-9

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		x	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	x		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: Andrea Sansom
Date: October 29, 2004
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-17
Test Name: PEST/PCB
Method No.: 8081A/8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Do any soil samples contain more than 50% water?	X		
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		X	

Notes: *Field coolers exceed limits, <10C: no action; >10C but < 20C: J/UJ,k*
When >10C, samples were recollected if possible.

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	X		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.			X

Notes: *EQB-1, EQB-2, and EQB-3 are associated with soil boring samples, located in other SDGs, detections are essentially irrelevant to this repo.*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	X		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	X		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		X	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows? If No, the associated sample result should be carefully evaluated.	X		

Notes:

5.0 GC/ECD Instrument Performance Check for Pesticides		Yes	No	NA
5.1	Is the 4,4'-DDT breakdown </= to 15%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).		X	
5.2	Is the endrin breakdown </= to 15%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	X		

Notes:

6.0 Surrogate Recovery					Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?				X		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.				X		
6.3	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?				X		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?						X
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)						X
	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance			
	1 out	high/low	No action	No action			
	2 out	2 high same column	K	No action			
		2 low same column	L, UL	No action			
		mixed same column	J, UJ	No action			
		2 high diff columns	J	Not applicable			
		2 low diff columns	J, UJ	Not applicable			
		mixed diff columns	Professional judgement	Not applicable			
	3 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		2 high, 1 low	K (2 high)	J (1 low 2nd column)			
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)			
		other mixed	J, UJ	Not applicable			
	4 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		Mixed	J, UJ	Not applicable			
	If any recovery is >0% and <10% then L(+)/R(-).						
	If any recovery is 0% then R(+/-).						

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?			X
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 30-150%?			
7.4	Are there any RPDs outside the QC limits not to exceed 60%?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

only 4 equipment blanks reported in this SDG, no FD required.

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	X		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 30-150%?		X	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?		X	
	If Yes, J(+) only.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			X
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

only 4 equipment blanks reported in this SDG, no FD required.

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).	X		
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	X		

Notes:

11.0 Pesticide Cleanup Checks		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes: *CLP requirement, not provided*

Case narrative indicates mercury was used to remove sulfur due to the possibility of degradation of some pesticide target analytes with use of the recommended cleanup with activated copper.

12.0 Data Completeness				Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	Pest	PCB	X		
	Number of samples:	4	4			
	Number of target compounds in each analysis:	21	7			
	Number of results rejected and not reported:	0	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)					
	% Completeness =	100%	100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP/ICPMS/CVAA
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-17
Project No.: 21355035.20001

Project Name: Radford SWMU54
Reviewer: Andrea Sansom
Date: 10/29/2004

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	x			x			x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x			x			x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x			x			x		
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)		x			x			x	
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	x			x			x		

Note: *The chain of custody and the sample container label had a different collection time for sample 54MW1. As directed from the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.*

Field coolers exceed limits, <10C: no action.

2.0 Holding Time		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		x			x			x	

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".	7+BLK			4+BLK			5+BLK		
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).	x			x			x		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	x			x			x		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based	x			x			x		
3.5	Were ICV/CCV reported from mutiple exposures (3 for ICP or 2 for CVAA) with passing %RSD (ICP < 5% or CVAA < 10%)? If no, contact project chemist for laboratory resolution.	x			x			x		
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP: 90%-110% & Hg: 80-120%	x			x			x		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%									
3.7	For one point curves on ICP & ICPMS, did the CRDL standard recover between 80-120%?			x			x	100%		
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K									

Note: _____

4.0 Blanks

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	x			x			x		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	x			x			x		
4.3	Are there reported MB or ICB/CCBs values > MDL?	x				x			x	
	Sample Results > MDL									
	< 5X Blank Contamination B									
4.4	Are there negative blank results with the absolute value > MDL?		x		x				x	
	Sample Results Non-detects > MDL									
	< 5X absolute Blank Contamination UL L									
4.5	Are there reported field blank > ± MDL?	x			x				x	
	Sample Results > MDL									
	< 5X Blank Contamination B									

Note: *EQB-1, EQB-2, and EQB-3 are associated with soil boring samples, located in other SDGs, detections are essentially irrelevant to this report.*

MWEQB-5 associtaed with 54MW1 and 54MW6 was non -detect

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	x			x					
5.2	Are the ICS AB recoveries within 80% - 120%?	x			x					
5.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		x			x				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?		x			x				
	If not...									
	Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)									
	< -IDL > IDL < 50% 50% - 79% >120%									
	L(+)/UL(-) K(+) L(+)/R(-) L(+)/UL(-) K(+)									

Note:

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	x			x			x		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		x			x			x	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)									

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.			x	x					x
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.									
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.			x	x					x

Note: *54MW1 (T/D Mn) passed*

Full list metals for this aquoues matrix SDG was for equipment blanks only, no MS/MSD performed or required.

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.			x	x					x
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?									
	%R > 125% 30%< %R < 74% < 30%			x	x					x
	Positive K L L									
	Non-detect None UL R									
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.			x	x					x

Note: *54MW1 (T/D Mn) passed*

Full list metals for this aquoues matrix SDG was for equipment blanks only, no MS/MSD performed or required.

9.0 Instrument Detection Limits (IDL)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	x			x			x		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?			x	x					
10.2	Was a five-fold dilution performed?			x	x					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).			x			ND			

Note: *54MW1 (T/D Mn) passed*

Full list metals for this aquoues matrix SDG was for equipment blanks only, no serial dilution performed or required.

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?			x			x			x
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.									
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report			x			x			x

Note: *EQB-1, EQB-2, and EQB-3 are associated with soil boring samples.*

For the remaining samples for total and dissolved Mn, see MS/MSD for field duplicate precision as no field duplicate sample was collected.

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?			x			x			x
12.2	Were all dilutions reflected in the positive results and detection limits?			x			x			x
12.3	Were the Internal Standard recoveries within 30-120% (6020) or 80-120% (6010B)?	x			x					
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	x								
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	x								
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	x								

Note:

13.0 Completeness Calculation		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	x			x			x		
13.1.1	Number of samples: 3+3									
13.1.2	Number of target compounds in each analysis: 2+24									
13.1.3	Number of results rejected and not reported: 0									
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%									

Note:

Radford Army Ammunition Plant
Chain of Custody Record

pg. 1 of 1

CART 0

1242 → WR

TM0994

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000031

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA code	Matrix code	Test Group	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
EQB-1	8.17.04	2010	S		X	5	R	U	1								X											
↓	↓	↓	S		X	5	S	U	8				X	X	X										→		42	368215
																									W	30		
																									EB			

Box #1			
	1. Soil	6. Trip Blank	
	2. Sediment	7. Oil	
	3. Surface Water	8. Waste	
	4. Possible Fill	9. Other _____	
	5. Rinsate		

Box #2		
Y. Yellow / HCl	W. White / None	E. En Core / None
S. Salmon / None	M. Manila / None	O. Other
G. Green / None	DB. Dark Blue / H_2SO_4	
LB. Lt. Blue / NaOH	LY. Light Yellow / None	
R. Red / HNO_3	RW. Red & White Stripes / HNO_3	

Box #3	
F. Filtered	
U. Unfiltered	

Box #4	
R. Rush - 3 Day	
S. Standard - 28 Day	
T. Timely - 14 Day	
O. Other _____	

1. Relinquished by:	Date/Time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8.18.04 / 1506			36440-17
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Lou Pelton	8/19/04 9:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

4.0°C

4.1°C (1)

Radford Army Ammunition Plant
Chain of Custody Record

pg 1 of 1 Cart 2 TM0029 (VOA) 1243

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000032

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA code	Matrix code	Test Groups	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54GW57	8.17.04	2045	S		X	9	S	U	4						X										N 1	WG	43	368216
54GW56	8.18.04	1215	S		X	9	S	U	4						X										N 1	WG	43	368217

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Lab Sample ID

Box #1 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other Ground Water

Box #2 Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8.18.04 / 1500			36440-17
1. Received by:	Date/time	2. Received by:	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Teri Parker	8/19/04 9:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

1.9°C (2)

Radford Army Ammunition Plant
Chain of Custody Record

pg 1 of 1 — Cart 3 TM0886 — J 1262 (WR)

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

00033

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA Code	Matrix Code	Test Group	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
SWGW56 MS/MSD	8.18.04	1215	5		X	9	5	U	12						X												MS/MSD

Box #1 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other Ground water

Box #2 Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8.18.04/1600			36440-17
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Ken Pakos	8/19/04 9:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

1.8 (3)

Radford Army Ammunition Plant
Chain of Custody Record

Cart 2

1266 → (Lee)

JM0291

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

0000034

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA CODE	MATRIX CODE	TEST GROUP	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
54GW59	8.18.04	1500	S		X	9	S	U	4						X										N1	WG	43	368218
DUP-3	8.18.04	—	S		X	9	S	U	4						X										FD1	WG	43	368236

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other Ground H_2O

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8-18-04/1600			36440-17
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Tom Baker	8/19/04 9:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

1.9°C

(4)

TriMatrix Laboratories, Inc.

SAMPLE PRESERVATION VERIFICATION FORM

Client	Project-Submittal No.
Radford Army	36440-17
Receipt Log No.	**Completed By (initials/date)** / **Project Chemist**
37-4	LKP 8/19/04 / CJR

COC ID No. 1242

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Container Type	5	4	13		3	6	15	
Tag Color	Lt. Blue	Blue	Brown		Green	Red	Red Stripe	
Preservative	NaOH	H_2SO_4	H_2SO_4		None	HNO_3	HNO_3	
Expected pH	>12	<2	<2		~7	<2	<2	
COC Line No. 1						✓		
COC Line No. 2								
COC Line No. 3								
COC Line No. 4								
COC Line No. 5								
COC Line No. 6								
COC Line No. 7								
COC Line No. 8								
COC Line No. 9								
COC Line No. 10								

Comments

pH strip lot No.
☑ OC472433
☐ _____

Aqueous Samples: For each sample and container type, check the box if pH is acceptable. **If pH is not acceptable for any sample container, record pH in box, and note on Sample Receiving Checklist and on Sample Receiving Non-Conformance Form.** If approved by Project Chemist, add acid or base to the sample to achieve the correct pH. Add up to, but do not exceed 2x the volume initially added at container prep (see table below for initial volumes used). **Add orange pH tag to sample container and record information requested. Record adjusted pH on this form. Do not adjust pH for container types 3, 6, and 15.**

COC ID No.

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Container Type	5	4	13		3	6	15	
Tag Color	Lt. Blue	Blue	Brown		Green	Red	Red Stripe	
Preservative	NaOH	H_2SO_4	H_2SO_4		None	HNO_3	HNO_3	
Expected pH	>12	<2	<2		~7	<2	<2	
COC Line No. 1								
COC Line No. 2								
COC Line No. 3								
COC Line No. 4								
COC Line No. 5								
COC Line No. 6								
COC Line No. 7								
COC Line No. 8								
COC Line No. 9								
COC Line No. 10								

Comments

Container Size (mL)	Original Vol. of Preservative (mL)
Container Type 5:	NaOH
500	2.5
1000	5.0
Container Type 4:	H_2SO_4
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H_2SO_4
500	2.5

000039

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army
Receipt Record Page/Line No.:
Project-Submittal No.: (new) add to 36440-17
Project Chemist: WSR
Sample Nos.:

Coolers Received

Recorded by (initials/date): KNC / 08.19.04

Cooler ☒ Box ☐ Other ☐ Qty Received:

Thermometer Used: ☐ IR Gun (#94) ☐ Digital Thermometer (#54) ☐ Other (#_____) ☐ See Additional Cooler Information Form

Cooler No.	Time	Custody Seals	Coolant Location	Coolant / Temperature Taken Via	Alternate Temperature Taken Via	Recorded °C	Correction Factor °C	Actual °C	Cooler ID on COC?	VOC trip blank received?
TM0029	9:35	☐ none ☒ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container	tb: not measured			☒	☐
						1: 1.5	0	1.5		
						2: 2.4	0	2.4		
						3: 1.7	0	1.7		
							Average °C	1.9		
TM0576	9:35	☐ none ☒ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container	tb: not measured			☒	☐
						1: 3.6	0	3.6		
						2: 1.3	0	1.3		
						3: 0.8	0	0.8		
							Average °C	1.9		
TM0886	9:45	☐ none ☒ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container	tb: not measured			☒	☐
						1: 2.2	0	2.2		
						2: 1.2	0	1.2		
						3: 2.1	0	2.1		
							Average °C	1.8		
TM0264	9:50	☐ none ☒ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container	tb: not measured			☒	☐
						1: 8.7	0	8.7		
						2: 1.9	0	1.9		
						3: 1.9	0	1.9		
							Average °C	4.2		

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☒	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by _____
	☒		Rec'd for Lab signed/date/time?
☐	☒		Shipping Document?
☐	☐		Other _____

COC ID Nos.: 1243, 1240, 1241, 1263, 1262, 1264, 1265, 1242, 1266,

☐ TriMatrix ☒ Other (name or ID#) Radford

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☒	☐	Sample ID matches COC?
☐	☒	Sample date and time matches COC?
☒	☐	Container type completed on COC?
☒	☐	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
	☐	☒	Broken containers/lids?
	☐	☒	Missing or incomplete labels?
	☐	☒	Illegible information on labels?
	☐	☒	Low volume received?
	☐	☒	Inappropriate containers received?
☒	☐		VOC vials have headspace?
☐	☐	☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☒	☐	All sample temperatures ≤4° C?
☐	☒		Completed Sample Preservation Verification Form?
☐	☒		Samples preserved correctly?
☒	☐		If "No", added orange tag?
☒	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes Applicable to COC #'s: 1242, 1243, 1262, 1266. See 36440-18 version of this checklist for remaining COC's (WR)

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) _____
☐ No analysis requested, Proj. Chemist completed (init./date) _____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/19/04 9:00	8/19/04 10:55	Yes (No)

000041

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST
ADDITIONAL COOLER INFORMATION

Recorded by (initials/date)	Client	Project-Submittal No.
KNC 10.8.19.04	Radford Army	36440-17
	Receipt Log No. 374 / Sample Nos.	Project Chemist WJR

Cooler No. TMO 994 — Time 10:00

Custody Seals
- ☐ none
- ☒ present / intact
- ☐ present / not intact

Coolant Location: (Dispersed) / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☒ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	4.1	0	4.1
tb location: representative / in ice			
1	3.3	0	3.3
2	3.9	0	3.9
3	4.7	0	4.7
		Average °C	4.0

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. TMO 291 — Time 10:05

Custody Seals
- ☐ none
- ☒ present / intact
- ☐ present / not intact

Coolant Location: (Dispersed) / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☒ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	1.9	0	1.9
tb location: representative / in ice			
1	2.2	0	2.2
2	3.5	0	3.5
3	3.7	0	3.7
		Average °C	3.1

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Comments

000042

Radford Army Ammunition Plant
Chain of Custody Record

Pg 1 of 1 — 1267 → WR2 — Big Cart — TM0548

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

00045

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SO4 Cold	Matrix Cold	Test Group	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
EQB-2	8·18·04	1930	5		X	5	S	U	8				X	X	X												368329
↓	↓	↓	5		X	5	R	U	1								X										

Box #1 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other _____

Box #2 Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8·19·04 1610			36440-17
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Jan Plakos	8/20/04 8:40			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Radford Army Ammunition Plant
Chain of Custody Record

1274-7 (WR)

1319 Lou

TM0153

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

0000046

Project Number: SWMU 54

Project Name: RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	5 ot Code	Matrix Code	Test Group	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
EQB-3	8-19-04	1555	5		X	5	R	U	1								X										
↓	↓	↓	5		X	5	S	U	8				X	X	X									EB1	WQ	42	368330

Box #1 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other _____

Box #2 Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8/9/04 1610			36440-17
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Lori Pekar	8/20/04 8:40			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(2)

TriMatrix Laboratories, Inc.

SAMPLE PRESERVATION VERIFICATION FORM

page 1 of 1

Client	Project-Submittal No.
Radford Army	36440-17
Receipt Log No. 39-6	Completed By (initials/date) LKP 8/20/04
	Project Chemist CWR

COC ID No. 1267

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Container Type	5	4	13	3	6	15
Tag Color	Lt. Blue	Blue	Brown	Green	Red	Red Stripe
Preservative	NaOH	H_2SO_4	H_2SO_4	None	HNO_3	HNO_3
Expected pH	>12	<2	<2	~7	<2	<2
COC Line No. 1						
COC Line No. 2					✓	
COC Line No. 3						
COC Line No. 4						
COC Line No. 5						
COC Line No. 6						
COC Line No. 7						
COC Line No. 8						
COC Line No. 9						
COC Line No. 10						

Comments

COC ID No. 1274

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Container Type	5	4	13	3	6	15
Tag Color	Lt. Blue	Blue	Brown	Green	Red	Red Stripe
Preservative	NaOH	H_2SO_4	H_2SO_4	None	HNO_3	HNO_3
Expected pH	>12	<2	<2	~7	<2	<2
COC Line No. 1					✓	
COC Line No. 2						
COC Line No. 3						
COC Line No. 4						
COC Line No. 5						
COC Line No. 6						
COC Line No. 7						
COC Line No. 8						
COC Line No. 9						
COC Line No. 10						

Comments

pH strip lot No.

☐ OC472433

☐

Aqueous Samples: For each sample and container type, check the box if pH is acceptable. **If pH is not acceptable for any sample container, record pH in box, and note on Sample Receiving Checklist and on Sample Receiving Non-Conformance Form.** If approved by Project Chemist, add acid or base to the sample to achieve the correct pH. Add up to, but do not exceed 2x the volume initially added at container prep (see table below for initial volumes used). **Add orange pH tag to sample container and record information requested. Record adjusted pH on this form. Do not adjust pH for container types 3, 6, and 15.**

Container Size (mL)	Original Vol. of Preservative (mL)
Container Type 5:	NaOH
500	2.5
1000	5.0
Container Type 4:	H_2SO_4
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H_2SO_4
500	2.5

000050

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army
Receipt Record Page/Line No.: 39-6
Project-Submittal No.: new / (add to) 36440-17
Project Chemist: WBR
Sample Nos.:

Coolers Received

Recorded by (initials/date): LKP 8/20/04

☑ Cooler ☐ Box ☐ Other ____ Qty Received

☑ IR Gun (#94) Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (# ____) ☐ See Additional Cooler Information Form

Cooler No.	Time	Custody Seals	Coolant Location	Coolant/Temperature Taken Via	Alternate Temperature Taken Via	Recorded °C	Correction Factor °C	Actual °C
TM0998	9:35	☐ none ☑ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container	tb 0.0	0	0.0
						tb location: representative (in ice)		
						1 0.3	0	0.3
						2 0.1	0	0.1
						3 0.8	0	0.8
							Average °C	0.4
						☑ Cooler ID on COC?		
						☐ VOC trip blank received?		
TM0929	10:15	☐ none ☑ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container	tb 1.6	0	1.6
						tb location: representative (in ice)		
						1 1.5	0	1.5
						2 2.1	0	2.1
						3 2.3	0	2.3
							Average °C	1.9
						☑ Cooler ID on COC?		
						☐ VOC trip blank received?		
TM0548	10:35 ✓	☑ ~~none~~ ☐ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container	tb 2.5	0	2.5
						tb location: representative / in ice		
						1 2.7	0	2.7
						2 2.1	0	2.1
						3 2.2	0	2.2
							Average °C	2.3
						☑ Cooler ID on COC?		
						☐ VOC trip blank received?		
TM0153	10:55 ✓	☐ none ☑ ~~present / intact~~ ☐ present / not intact	Dispersed / Top / Middle / Bottom	☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container	tb 4.3	0	4.3
						tb location: representative / (in ice) - water		
						1 5.3	0	5.3
						2 5.0	0	5.0
						3 6.4	0	6.4
							Average °C	5.6
						☑ Cooler ID on COC?		
						☐ VOC trip blank received?		

melted 30 min

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos.
☐ TriMatrix: 1270, 1271, 1268, 1269, (1267), (1274), 1272
☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	■	Sample ID matches COC?
☐	■	Sample date and time matches COC?
☑		Container type completed on COC?
☑	■	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
		☑	Broken containers/lids?
		☑	Missing or incomplete labels?
		☑	Illegible information on labels?
		☑	Low volume received?
		☑	Inappropriate containers received?
☑		☐	VOC vials have headspace?
☑		☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☐	☑	All sample temperatures ≤4° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☐	■	Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils? ☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes This version of checklist applies to COC #'s 1267 & 1274.

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date)

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/20/04 8:40	8/20/04 11:30	Yes (No)

Radford Army Ammunition Plant
Chain of Custody Record

pg 1 of 1 — 0001 — added by WR — Cart 8 TM0739

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000054

Project Number: SWMU 54
Project Name: RFAAP
Project Contact (Name and Phone Number): Darren Renne 804.965.9000
Samplers: David Copen & John Spangler

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA CODE	MATRIX CODE	TEST GROUP	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54GW70	8.20.04	1200	S		X	9	S	U	4						X										WG	N1	43	Lab sample ID 36836
54GW68	8.20.04	1315	S		X	9	S	U	4						X										WG	N1	43	36836-27
54GW65	8.20.04	1400	S		X	9	S	U	4						X										WG	N1	43	36836-28
54GW66	8.20.04	1455	S		X	9	S	U	2						X										WG	N1		remaining 2 bottles are in other cooler.

Lab Contact: Walt Roudebush 616.975.4561
AIRBILL No:
Courier: Fed Ex

Box #1: 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other Ground H_2O

Box #2: Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3: F. Filtered; U. Unfiltered

Box #4: R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by: David Copen — Date/time: 8.20.04 1945
1. Received by: Joe Tabor — Date/time: 8/21/04 9:10
2. Relinquished by: — Date/Time
2. Received by: — Date/Time

Additional Comments: 36440-17

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(1)

Radford Army Ammunition Plant
Chain of Custody Record

002
COC ID added by WRE

Cart 8
#1

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000055

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA CODE	MATRIX CODE	TEST GROUP
EQB-4	8.20.04	1745	S		X	S	S	U	4				X	X											EB	L9	45

ANALYSES

Lab Contact:
Walt Roudebush
616.975.4561
AIRBILL No:

Courier:
Fed Ex

REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
Lab Sample ID
36-3659

Box #1			
1. Soil	6. Trip Blank		
2. Sediment	7. Oil		
3. Surface Water	8. Waste		
4. Possible Fill	9. Other _____		
5. Rinsate			

Box #2			
Y. Yellow / HCl	W. White / None	E. En Core / None	
S. Salmon / None	M. Manila / None	O. Other	
G. Green / None	DB. Dark Blue / H_2SO_4		
LB. Lt. Blue / NaOH	LY. Light Yellow / None		
R. Red / HNO_3	RW. Red & White Stripes / HNO_3		

Box #3	
F. Filtered	
U. Unfiltered	

Box #4	
R. Rush - 3 Day	
S. Standard - 28 Day	
T. Timely - 14 Day	
O. Other _____	

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time
David Copen	8-20-04 1945		
1. Received by:	Date/time	2. Received by:	Date/Time
Lai Phakoe	8/21/04 9:10		

Additional Comments:
36440-17

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(2)

Radford Army Ammunition Plant
Chain of Custody Record

003 coc 20 added to WR
pg 1 of 1
Cart 5
TM0912

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

00056

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers:

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54GW66	8·20·04	1455	S		X	9	S	U	2						X										
																									remaining 2 bottles in another cooler
54GW67	8·20·04	1545	S		X	9	S	U	4						X										
54GW69	8·20·04	1550	S		X	9	S	U	4						X										

DO NOT LOG-IN. Per client, place these samples on HOLD. Will advise. THANKS — WALT

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other Ground H2O

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Green	8·20·04 1945			
1. Received by:	Date/time	2. Received by:	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Jan Parker	8/21/04 9:10			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army — Receipt Record Page/Line No.: 41-3
new / add to — Project-Submittal No.: 36440-17
Project Chemist: LJR — Sample Nos.:

Coolers Received

Recorded by (initials/date): LKP 8/21/04

☑ Cooler ☐ Box ☐ Other ____ — Qty Received: 5

☑ IR Gun (#94) — Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (# ____) — ☐ See Additional Cooler Information Form

Cooler No.	Time
#1	10:50

Custody Seals: ☑ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / (Middle) / Bottom
Coolant/Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	11.3	0	11.3
1	12.6	0	12.6
2	11.8	0	11.8
3	14.9	0	14.9

tb location: (representative) / in ice
Average °C: 13.1
☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time
TM0739	10:55

Custody Seals: ☑ none ☐ present / intact ☐ present / not intact ✓
Coolant Location: Dispersed / (Top) / Middle / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	8.9	0	8.9
1	7.9	0	7.9
2	8.3	0	8.3
3	7.8	0	7.8

tb location: (representative) / in ice
Average °C: 8.0
☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time
TM0884	11:10

Custody Seals: ☑ none ☐ present / intact ☐ present / not intact
Coolant Location: (Dispersed) / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	4.5	0	4.5
1	4.3	0	4.3
2	3.2	0	3.2
3	4.6	0	4.6

tb location: representative / (in ice)
Average °C: 4.0
☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time
TM0912	11:25

Custody Seals: ☐ none ☐ present / intact ☐ present / not intact ✓
Coolant Location: Dispersed / Top / (Middle) / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	14.6	0	14.6
1	13.7	0	13.7
2	14.2	0	14.2
3	15.0	0	15.0

tb location: (representative) / in ice
Average °C: 14.3
☑ Cooler ID on COC? ☐ VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos.

☐ TriMatrix

☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☐	Sample ID matches COC?
☐	☐	Sample date and time matches COC?
☐		Container type completed on COC?
☑	☐	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
		☐	Broken containers/lids?
		☑	Missing or incomplete labels?
		☑	Illegible information on labels?
		☑	Low volume received?
		☐	Inappropriate containers received?
☑		☐	VOC vials have headspace?
☑		☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☐	☑	All sample temperatures ≤4° C?
☑	☐		Completed Sample Preservation Verification Form?
☑	☐		Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

This version of checklist applies to COC's 001 & 002.
Samples for COC 003 are on hold.

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/21/04 9:10	8/21/04 11:50	Yes (No)

Radford Army Ammunition Plant
Chain of Custody Record

COC 004 (-4m?) Pg 1 of 1

Cart 4
TM0791

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000063

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA Code	Matrix Code	Test Group	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
54GW67	8.23.04	1410	5		X	9	S	U	4						X										N1	GW	43	368726
54GW66	8.23.04	1415	5		X	9	S	U	2						X										N1	GW	43	368727
54GW69	8.23.04	1450	5		X	9	S	U	4						X										N1	GW	43	368728

Box #1			
1.	Soil	6.	Trip Blank
2.	Sediment	7.	Oil
3.	Surface Water	8.	Waste
4.	Possible Fill	9.	Other Grand H_2O
5.	Rinsate		

Box #2			
Y.	Yellow / HCl	W.	White / None
S.	Salmon / None	M.	Manila / None
G.	Green / None	DB.	Dark Blue / H_2SO_4
LB.	Lt. Blue / NaOH	LY.	Light Yellow / None
R.	Red / HNO_3	RW.	Red & White Stripes / HNO_3
E.	En Core / None		
O.	Other		

Box #3	
F.	Filtered
U.	Unfiltered

Box #4	
R.	Rush - 3 Day
S.	Standard - 28 Day
T.	Timely - 14 Day
O.	Other _____

1. Relinquished by:	Date time	2. Relinquished by:	Date Time	Additional Comments:
David Copen	8.23.04 1730			36440-17
1. Received by:	Date time	2. Received by:	Date Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Ron Lakes	8/24/04 8:30			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(1)

Radford Army Ammunition Plant
Chain of Custody Record

COC #08

Cart 4
TM0672

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000064

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA CODE	MATRIX CODE	Test Group	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
54GW64	8.23.04	1500	S		X	9	S	U	4						X										N1	W6	43	368729
54GW63	8.23.04	1545	S		X	9	S	U	2						X										N1	W6	43	2 bottles to follow
																												368730
DUP-9	8.23.04	—	S		X	9	S	U	4						X										FD1	W6	43	368731

Box #1			
1. Soil	6. Trip Blank		
2. Sediment	7. Oil		
3. Surface Water	8. Waste		
4. Possible Fill	9. Other Ground H2O		
5. Rinsate			

Box #2		
Y. Yellow / HCl	W. White / None	E. En Core / None
S. Salmon / None	M. Manila / None	O. Other
G. Green / None	DB. Dark Blue / H_2SO_4	
LB. Lt. Blue / NaOH	LY. Light Yellow / None	
R. Red / HNO_3	RW. Red & White Stripes / HNO_3	

Box #3	
F. Filtered	
U. Unfiltered	

Box #4	
R. Rush - 3 Day	
S. Standard - 28 Day	
T. Timely - 14 Day	
O. Other _____	

1. Relinquished by:	Date time	2. Relinquished by:	Date Time	Additional Comments:
David Copen	8.23.04 1730			36440-17
1. Received by:	Date time	2. Received by:	Date Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
John Parker	8/24/04 8:30			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

1.4°C

(2)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army | Project-Submittal No.: new / (add to) 36440-17
Receipt Record Page/Line No.: 45-3 | Project Chemist: CMR | Sample Nos.:

Coolers Received

Recorded by (initials/date): LKP 8/24/04

☑ Cooler ☐ Box ☐ Other ____ | Qty Received: 2

☐ IR Gun (#94) | Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (# ____) | ☐ See Additional Cooler Information Form

Cooler 1

Cooler No.: TM0791 | Time: 8:35

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact

Coolant Location: (Dispersed) / Top / Middle / Bottom

Coolant/Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers

Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	1.1	0	1.1
tb location: representative / (in ice)			
1	1.9	0	1.9
2	3.7	0	3.7
3	2.1	0	2.1
Average °C			2.6

☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler 2

Cooler No.: TM0672 | Time: 8:50

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact

Coolant Location: (Dispersed) / Top / Middle / Bottom

Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers

Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	2.5	0	2.5
tb location: representative / (in ice)			
1	1.7	0	1.7
2	0.6	0	0.6
3	2.0	0	2.0
Average °C			1.4

☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler 3

Cooler No.: ____ | Time: ____

Custody Seals: ☐ none ☐ present / intact ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers

Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler 4

Cooler No.: ____ | Time: ____

Custody Seals: ☐ none ☐ present / intact ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers

Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

☐ Cooler ID on COC? ☐ VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos.

☐ TriMatrix

☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☐	Sample ID matches COC?
☑	☐	Sample date and time matches COC?
☑		Container type completed on COC?
☑	☐	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
		☑	Broken containers/lids?
		☑	Missing or incomplete labels?
		☑	Illegible information on labels?
		☑	Low volume received?
		☑	Inappropriate containers received?
☑		☐	VOC vials have headspace?
☑		☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☑	☐	All sample temperatures ≤4° C?
☑	☐		Completed Sample Preservation Verification Form?
☑	☐		Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/24/04 8:30	8/24/04 8:45	(Yes) No

Radford Army Ammunition Plant
Chain of Custody Record

COC 009 — added by WK 8/25/04 — Cart 5 TM0946

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000070

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Capen & John Spangler

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA Code	Matrix Code	Test Group	Lab Sample ID
54GW61	8.24.04	1245	S		X	9	S	U	4						X										N1		43	36343
54MW1 & MS MSD	8.24.04	1745	S		X	9	R	U	1								X											
54MW1 & MS MSD	8.24.04	1745	S		X	9	RW	F	1								X								N1		47	36984

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other Ground H_2O

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by:	Date time	2. Relinquished by:	Date Time
David Capen	8.24.04 1800		
1. Received by:	Date time	2. Received by:	Date Time
Lisa Parker	8/25/04 8:45		

Lab Contact: Walt Roudebush 616.975.4561
AIRBILL No:
Courier: Fed Ex

REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID

Additional Comments: 36440-17

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

47-11

(1)

Radford Army Ammunition Plant
Chain of Custody Record

COC #10 — added by MR 8/25/04

Cart 2

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000071

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Cepen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SO4 code	Matrix code	Test Group	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
																											Lab Sample SO
54GW62	8.23.04	1600	S		X	9	S	U	4						X										N1	W6	43	36833-15
54GW63	8.23.04	1545	S		X	9	S	U	2						X													additional sample for that recvd on 8/24
54GW60	8.24.04	1130	S		X	9	S	U	4						X										N1	W6	43	36834-16
54GW58	8.24.04	1100	S		X	9	S	U	4						X										N1	W6	43	36835-17

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other Ground H_2O

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by:	Date time	2. Relinquished by:	Date Time	Additional Comments:
David Cepen	8.24.04 1745			36440-17
1. Received by:	Date time	2. Received by:	Date Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Jan Pekos	8/25/04 8:45			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(2)

TriMatrix Laboratories, Inc.

SAMPLE PRESERVATION VERIFICATION FORM

Client	Project-Submittal No.
Radford Army	36440-17
Receipt Log No.	**Completed By (initials/date)**	**Project Chemist**
47-11	LKP 8/25/04	WSR

COC ID No. —

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Container Type	5	4	13		3	6	15	
Tag Color	Lt. Blue	Blue	Brown		Green	Red	Red Stripe	
Preservative	NaOH	H_2SO_4	H_2SO_4		None	HNO_3	HNO_3	
Expected pH	>12	<2	<2		~7	<2	<2	
COC Line No. 1								
COC Line No. 2						✓		
COC Line No. 3							✓	
COC Line No. 4								
COC Line No. 5								
COC Line No. 6								
COC Line No. 7								
COC Line No. 8								
COC Line No. 9								
COC Line No. 10								

Comments

pH strip lot No.
☒ OC472433
☐ _____

Aqueous Samples: For each sample and container type, check the box if pH is acceptable. **If pH is not acceptable for any sample container, record pH in box, and note on Sample Receiving Checklist and on Sample Receiving Non-Conformance Form.** If approved by Project Chemist, add acid or base to the sample to achieve the correct pH. Add up to, but do not exceed 2x the volume initially added at container prep (see table below for initial volumes used). **Add orange pH tag to sample container and record information requested. Record adjusted pH on this form. Do not adjust pH for container types 3, 6, and 15.**

COC ID No.

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Container Type	5	4	13		3	6	15	
Tag Color	Lt. Blue	Blue	Brown		Green	Red	Red Stripe	
Preservative	NaOH	H_2SO_4	H_2SO_4		None	HNO_3	HNO_3	
Expected pH	>12	<2	<2		~7	<2	<2	
COC Line No. 1								
COC Line No. 2								
COC Line No. 3								
COC Line No. 4								
COC Line No. 5								
COC Line No. 6								
COC Line No. 7								
COC Line No. 8								
COC Line No. 9								
COC Line No. 10								

Comments

Container Size (mL)	Original Vol. of Preservative (mL)
Container Type 5:	NaOH
500	2.5
1000	5.0
Container Type 4:	H_2SO_4
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H_2SO_4
500	2.5

000074

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army
Receipt Record Page/Line No: 47-11
Project-Submittal No.: new / add to 36440-17
Project Chemist: LSJR
Sample Nos.:

Coolers Received

Recorded by (initials/date): LKP 8/25/04

☑ Cooler ☐ Box ☐ Other ____ | Qty Received: 2

☑ IR Gun (#94) | Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (# ____) | ☐ See Additional Cooler Information Form

Cooler No.	Time	Custody Seals	Coolant Location	Coolant/Temperature Taken Via	Alternate Temperature Taken Via	Recorded °C	Correction Factor °C	Actual °C
TM0946	9:40	☑ none ☐ present / intact ☐ present / not intact	(Dispersed) / Top / Middle / Bottom	☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container	tb:		
						1: 0.9	0	0.9
						2: 0.8	0	0.8
						3: 0.6	0	0.6
							Average °C	0.8
		☑ Cooler ID on COC? ☐ VOC trip blank received?						
TM0906	10:50	☐ none ☑ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☒ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container	tb: 1.1	0	1.1
						1: 2.5	0	2.5
						2: 1.7	0	1.7
						3: 2.1	0	2.1
							Average °C	2.1
		☑ Cooler ID on COC? ☐ VOC trip blank received?						
		☐ none ☐ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☒ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container	tb:		
						1:		
						2:		
						3:		
							Average °C	
		☐ Cooler ID on COC? ☐ VOC trip blank received?						
		☐ none ☐ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☒ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container	tb:		
						1:		
						2:		
						3:		
							Average °C	
		☐ Cooler ID on COC? ☐ VOC trip blank received?						

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos.

☐ TriMatrix

☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☒	Sample ID matches COC?
☐	☒	Sample date and time matches COC?
☑	☐	Container type completed on COC?
☑	☒	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
	☐	☑	Broken containers/lids?
	☐	☑	Missing or incomplete labels?
	☐	☑	Illegible information on labels?
	☐	☑	Low volume received?
	☐	☑	Inappropriate containers received?
☑	☐	☐	VOC vials have headspace?
☑	☐	☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☑	☐	All sample temperatures ≤4° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☒		Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/25/04 8:45	8/25/04 9:50	Yes (No)

000076

Radford Army Ammunition Plant
Chain of Custody Record

COC # 011 – added by [illegible] 8/26

Cart 5
TM0950

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000079

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations): Lab Sample ID

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SDG Code	Matrix Code	Test Group	Lab Sample ID
54MW6	8.25.04	1630	S		X	9	R	U	1								X										
↓	↓	↓	S		X	9	RW	F	1								X							N1	WG	47	368962
MWEQB-5	8.25.04	1730	S		X	5	R	U	1								X										
↓	↓	↓	S		X	5	RW	F	1								X							FD1	WG	47	368963

Box #1: 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other Ground H_2O

Box #2: Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3: F. Filtered; U. Unfiltered

Box #4: R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date time	2. Relinquished by:	Date Time	Additional Comments:
David Copen	8.25.04 1900			36440-17
1. Received by:	Date time	2. Received by:	Date Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
[illegible]	8/26/04 9:10			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

49-12

TriMatrix Laboratories, Inc.

SAMPLE PRESERVATION VERIFICATION FORM

page 1 of 1

Client		Project-Submittal No.
Radford Army		36440-17
Receipt Log No.	Completed By (initials/date)	Project Chemist
49-12	LKO 8/26/04	WJR

COC ID No. —

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Container Type	5	4	13		3	6	15	
Tag Color	Lt. Blue	Blue	Brown		Green	Red	Red Stripe	
Preservative	NaOH	H_2SO_4	H_2SO_4		None	HNO_3	HNO_3	
Expected pH	>12	<2	<2		~7	<2	<2	
COC Line No. 1						✓	✓	
COC Line No. 2						✓	✓	
COC Line No. 3								
COC Line No. 4								
COC Line No. 5								
COC Line No. 6								
COC Line No. 7								
COC Line No. 8								
COC Line No. 9								
COC Line No. 10								

Comments

pH strip lot No.

☑ OC472433

☐ _____

Aqueous Samples: For each sample and container type, check the box if pH is acceptable. **If pH is not acceptable for any sample container, record pH in box, and note on Sample Receiving Checklist and on Sample Receiving Non-Conformance Form.** If approved by Project Chemist, add acid or base to the sample to achieve the correct pH. Add up to, but do not exceed 2x the volume initially added at container prep (see table below for initial volumes used). **Add orange pH tag to sample container and record information requested. Record adjusted pH on this form. Do not adjust pH for container types 3, 6, and 15.**

COC ID No.

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Container Type	5	4	13		3	6	15	
Tag Color	Lt. Blue	Blue	Brown		Green	Red	Red Stripe	
Preservative	NaOH	H_2SO_4	H_2SO_4		None	HNO_3	HNO_3	
Expected pH	>12	<2	<2		~7	<2	<2	
COC Line No. 1								
COC Line No. 2								
COC Line No. 3								
COC Line No. 4								
COC Line No. 5								
COC Line No. 6								
COC Line No. 7								
COC Line No. 8								
COC Line No. 9								
COC Line No. 10								

Comments

Container Size (mL)	Original Vol. of Preservative (mL)
Container Type 5:	NaOH
500	2.5
1000	5.0
Container Type 4:	H_2SO_4
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H_2SO_4
500	2.5

000081

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army | Project-Submittal No.: new / (add to) 36440-17
Receipt Record Page/Line No.: 49-12 | Project Chemist: WJR | Sample Nos.:

Coolers Received

Recorded by (initials/date): LKP 8/26/04

☑ Cooler ☐ Box ☐ Other ____ | Qty Received: 1

☑ IR Gun (#94) | Thermometer Used ☐ Digital Thermometer (#54) ☐ See Additional Cooler Information Form ☐ Other (#____)

Cooler No.	Time	Recorded °C	Correction Factor °C	Actual °C
TM0950	11:00			
		tb 1.3	0	1.3
		tb location: (representative) / in ice		
		1 0.6	0	0.6
		2 1.9	0	1.9
		3 1.2	0	1.2
			Average °C	1.2

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact
Coolant Location: Dispersed / (Top) / (Middle) / (Bottom)
Coolant/Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container
☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time	Recorded °C	Correction Factor °C	Actual °C
		tb		
		tb location: representative / in ice		
		1		
		2		
		3		
			Average °C	

Custody Seals: ☐ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☒ none / avg 2-3 containers
Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container
☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time	Recorded °C	Correction Factor °C	Actual °C
		tb		
		tb location: representative / in ice		
		1		
		2		
		3		
			Average °C	

Custody Seals: ☐ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☒ none / avg 2-3 containers
Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container
☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time	Recorded °C	Correction Factor °C	Actual °C
		tb		
		tb location: representative / in ice		
		1		
		2		
		3		
			Average °C	

Custody Seals: ☐ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☒ none / avg 2-3 containers
Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container
☐ Cooler ID on COC? ☐ VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos.

☐ TriMatrix

☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☒	Sample ID matches COC?
☑	☒	Sample date and time matches COC?
☑		Container type completed on COC?
☑	☒	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
	☐	☑	Broken containers/lids?
	☐	☑	Missing or incomplete labels?
	☐	☑	Illegible information on labels?
	☐	☑	Low volume received?
	☐	☑	Inappropriate containers received?
☑	☐		VOC vials have headspace?
☑	☐		Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☑	☐	All sample temperatures ≤4° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☑		Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/26/04 9:10	8/26/04 11:05	Yes / (No)

000082

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-18

Fraction: Explosives, Nitroglycerin, Pesticides, Polychlorinated Biphenyls, & Metals

Lab: TriMatrix

Project Name: Radford SWMU 54

Reviewer: Andrea Sansom

Date: November 8, 2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: For the explosive analyses, the continuing calibration analyzed on 08/25/2004 at 1910 displayed a percent difference greater than the control limit (i.e., 15%) on column C18 with a negative bias for HMX at 15.6%. The field sample extracts that were analyzed on the CN column that displayed acceptable continuing calibrations exhibited non-detect results. Since only one column is required to pass to report valid non-detect results, no data qualifying action was taken. All other HMX results were reported as non-detect from the C18 column and were flagged "UJ,c". The continuing calibration analyzed on 08/26/2004 at 1657 displayed a percent difference greater than the control limit on column CN with a negative bias for tetryl at 15.3%. All field sample extracts were analyzed on the C18 column that displayed acceptable continuing calibrations and non-detect results. Since only one column is required to pass to report valid non-detect results, no data qualifying action was taken.

For the pesticides analyses, the laboratory control spike displayed percent recoveries less than the laboratory lower control limits for alpha-chlordane at 56%, gamma-chlordane at 55%, and endrin ketone at 57%. Since these recoveries were greater than the QAPP lower control limit of 30%, no data qualifying action was taken. The surrogate recovery was greater than the laboratory generated upper control limit (i.e., 137%) for tetrachloro-m-xylene for 54SB58A at 142% and 54SB58C at 143%. Since these recoveries were less than the QAPP upper control limit of 150%, no data qualifying action was taken. The initial calibration verifications displayed percent differences greater than the control limit of 15% for the following:

Date	Time	Instrument	Column	Analyte	Percent Difference	Bias
09/01/2004	1413	158	A	Endosulfan sulfate	16.0%	+
				Endrin aldehyde	16.3%	+
				Endrin ketone	15.5%	+
09/22/2004	1209	158	A	d-BHC	18.0%	+
			B	most analytes	>15%	-

Since the associated field samples were reported non-detect from the column that displayed a positive bias, no data qualifying action was required. The continuing calibrations displayed the following percent differences greater than the control limit of 15%:

Date	Time	Column	Analyte	Percent Difference	Bias
09/01/2004	1941	A	4,4'-DDD	27.6%	+
			b-BHC	15.3%	+
			Methoxychlor	21.1%	+
		B	4,4'-DDE	16.1%	+
			Endosulfan sulfate	21.8%	-
09/02/2004	0137	B	Endosulfan sulfate	19.1%	-
			Methoxychlor	25.7%	-
09/15/2004	2136	B	4,4'-DDD	21.4%	-
			a-BHC	15.9%	+
			b-BHC	16.8%	+
09/16/2004	0034	B	4,4'-DDD	25.6%	-
			4,4'-DDT	17.8%	-
			b-BHC	27.3%	-
			d-BHC	24.4%	-
			Methoxychlor	20.0%	-
0925/2004	0041	A	4,4'-DDD	22.2%	-
			4,4'-DDT	16.7%	-
			b-BHC	22.2%	-
			d-BHC	26.5	-
			Methoxychlor	21.0%	-
		B	4,4'-DDD	15.3%	-
			a-BHC	15.6%	-
			Endrin	16.0%	-
			Heptachlor	16.2%	-
			Methoxychlor	16.8%	-

For the anomalous compounds that displayed a positive bias, the associated field sample results were either non-detect or reported positive using the concentration found on the passing column, thus, no data qualifying action was taken. For the anomalous compounds that displayed a negative bias, the associated field sample results were reported non-detect from the alternate passing column. Since only one column is required to pass to report a non-detect result, no data qualifying action was necessary. For anomalous compounds that displayed a negative bias on both analytical columns, the associated field sample results were non-detect and were flagged "UJ,c". One exception is the methoxychlor result for 54SB57A. The lower of the two concentrations was reported from column A that displayed a positive bias while the alternate column B displayed a negative bias in the continuing calibration. Since this result was previously flagged for dual column imprecision, no further data qualifying action was taken. Field sample 54SB57A displayed positive detections with a relative percent difference greater than 40% between the two analytical column concentrations. These results were flagged "J,g".

For the polychlorinated biphenyls analyses, the matrix spike pair performed on 54SB57B displayed a matrix spike recovery greater than the laboratory generated upper control limit of 134% for 1260 at 145%. This matrix spike pair also displayed a relative percent difference greater than the laboratory generated limit of 20% for 1016 at 23%. Since these

recoveries were within the QAPP specified recovery limits of 30-150% and precision limit of less than 60%, no data qualifying action was taken.

For the metals analyses, the instrument initial and/or continuing calibration blanks displayed negative estimate detections less than the reporting limit for barium, iron, manganese, sodium, and vanadium. The associated positive field sample results were greater than five times the absolute value of the negative blank detections, thus, no data qualifying action was required. The associated non-detect field sample results for sodium were flagged "UL,o". The initial and/or continuing calibration blanks displayed positive estimate detections less than the reporting limit for aluminum, magnesium, sodium, and zinc. The associated positive field sample results less than five times the blank concentrations were flagged "B,o". The method blank for batch 98672-123 displayed the following detections:

Analyte	Concentration (mg/Kg)
Aluminum	17.4
Magnesium	31.9
Zinc	1.36

These detections were attributed to instrument drift; therefore, no data qualifying action was taken. The equipment blank EQB-1 displayed positive estimate detections for antimony at 0.986 ug/L and iron at 13.93 ug/L. The positive equipment blank result for antimony was previously qualified due to continuing calibration blank detections and no further data qualifying action was taken. Positive field sample results for iron were greater than five times the equipment blank detection and no data qualifying action was required. Although the matrix spike pair performed on sample 54SB57B displayed acceptable recoveries greater the laboratory generated lower control limit of 51% for selenium at 62% and 63%, the post digestion spike recovery was less than the lower control limit of 75% for selenium at 70%. The laboratory reported the concentration of selenium for this sample as calculated from the method of standard additions. The serial dilution performed on sample 54SB57B displayed percent differences greater than the control limit of 10% for cobalt at 13.6%, nickel at 15.4%, and zinc at 12.1%. The associated field sample results were positive and were flagged "J,s".

Correctable Anomalies: The chain of custody and the sample container label had a different collection time for sample 54SB59B. As directed by the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.

Comments: A cooler containing all field samples for metals analyses and 54SB59B, 54SB59C, and DUP-2 for all analyses were received by the laboratory with a temperature less than the lower control limit of 2.0°C at 1.9°C. Since the containers were received intact and aliquots were not frozen, no impact to data quality was anticipated and no data qualifying action was taken. Due to the abundance of target element lead, samples 54SB57A and 54SB56A were analyzed at dilutions for this constituent only. The reporting limits for lead were elevated appropriately. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SWMU54
36440-18

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
368219	54SB57A	8/17/2004	Exp, Pest, PCBs, & Metals
368220	DUP-1	8/17/2004	Exp, Pest, PCBs, & Metals
368221	54SB57B	8/17/2004	Exp, Pest, PCBs, & Metals (+MS/MSD)
368222	54SB57C	8/17/2004	Exp, Pest, PCBs, & Metals
368223	54SB58A	8/17/2004	Exp, Pest, PCBs, & Metals
368224	54SB58B	8/17/2004	Exp, Pest, PCBs, & Metals
368225	54SB58C	8/17/2004	Exp, Pest, PCBs, & Metals
368226	54SB61A	8/17/2004	Exp, Pest, PCBs, & Metals
368227	54SB61B	8/17/2004	Exp, Pest, PCBs, & Metals
368228	54SB61C	8/17/2004	Exp, Pest, PCBs, & Metals
368229	54SB56A	8/18/2004	Exp, Pest, PCBs, & Metals
368230	54SB56B	8/18/2004	Exp, Pest, PCBs, & Metals
368231	54SB56C	8/18/2004	Exp, Pest, PCBs, & Metals
368232	54SB59A	8/18/2004	Exp, Pest, PCBs, & Metals
368233	54SB59B	8/18/2004	Exp, Pest, PCBs, & Metals
368234	54SB59C	8/18/2004	Exp, Pest, PCBs, & Metals
368235	DUP-2	8/18/2004	Exp, Pest, PCBs, & Metals

Radford Army Ammunitions Plant
SWMU54
Duplicate Statistics
54SB57C and DUP-1

	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	4xRL	Pass/ Fail
Explosives											
BDL											
Nitroglycerin											
BDL											
Pesticides											
BDL											
PCBs											
BDL											
Metals											
aluminum	mg/Kg	50	250	11900		11300		5.2%	600	200	Pass
antimony	mg/Kg	0.5	3	0.077	J	0.050	J	43%	**0.027**	2.0	Pass
arsenic	mg/Kg	0.4	2	0.85		0.75		13%	0.10	1.6	Pass
barium	mg/Kg	5.0	25	140		128		9.0%	12	20	Pass
beryllium	mg/Kg	1.0	5	0.33	J	0.26	J	24%	**0.1**	4.0	Pass
cadmium	mg/Kg	1.0	5	1.4		1.5		6.9%	0.1	4.0	Pass
calcium	mg/Kg	250	1250	1650		1590		**3.7%**	60	1000	Pass
chromium	mg/Kg	5.0	25	20		20		0.0%	0	20	Pass
cobalt	mg/Kg	1.0	5	9.1		8.5		6.8%	0.6	4.0	Pass
copper	mg/Kg	5.0	25	10		9.2		8.3%	0.8	20.0	Pass
iron	mg/Kg	10	50	20200		19200		5.1%	1000	40	Pass
lead	mg/Kg	1.0	5	11		8.8		22%	2.2	4.0	Pass
magnesium	mg/Kg	250	1250	3200		3030		5%	170	1000	Pass
manganese	mg/Kg	5	25	454		403		12%	51	20	Pass
mercury	mg/Kg	0.1	0.5	0.017	J	0.014	J	19%	**0.003**	0.4	Pass
nickel	mg/Kg	0.5	3	13.0		12		8.0%	1.0	2.0	Pass
potassium	mg/Kg	100	500	1360		1320		3.0%	40	400	Pass
silver	mg/Kg	3.0	15	0.48	J	0.060	J	156%	**0.42**	12.0	Pass
sodium	mg/Kg	100	500	102		113		10%	11	400	Pass
thallium	mg/Kg	0.5	3	0.16	J	0.14	J	13%	**0.02**	2.0	Pass
vanadium	mg/Kg	1.2	6	29		27		7.1%	2.0	4.8	Pass
zinc	mg/Kg	4.0	20	76		57		29%	19	16	Pass

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

Radford Army Ammunitions Plant
SWMU54
Duplicate Statistics
54SB59C and DUP-2

	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	4xRL	Pass/ Fail
Explosives											
BDL											
Nitroglycerin											
BDL											
Pesticides											
BDL											
PCBs											
BDL											
Metals											
aluminum	mg/Kg	50	250	9760		8760		11%	1000	200	Pass
antimony	mg/Kg	0.5	3	0.041	J	0.500	U	170%	**0.459**	2.0	Pass
arsenic	mg/Kg	0.4	2	0.58		0.52		11%	0.06	1.6	Pass
barium	mg/Kg	5.0	25	108		93		15%	15	20	Pass
beryllium	mg/Kg	1.0	5	0.40	J	0.32	J	22%	**0.1**	4.0	Pass
cadmium	mg/Kg	1.0	5	1.5		1.4		6.9%	0.1	4.0	Pass
calcium	mg/Kg	250	1250	1520		1380		**9.7%**	140	1000	Pass
chromium	mg/Kg	5.0	25	18		16		12%	2.0	20	Pass
cobalt	mg/Kg	1.0	5	7.7		6.8		12%	0.9	4.0	Pass
copper	mg/Kg	5.0	25	7.8		7.5		3.9%	0.3	20.0	Pass
iron	mg/Kg	10	50	15600		14300		8.7%	1300	40	Pass
lead	mg/Kg	1.0	5	7.9		6.2		24%	1.7	4.0	Pass
magnesium	mg/Kg	250	1250	2690		2460		9%	230	1000	Pass
manganese	mg/Kg	5	25	398		354		12%	44	20	Pass
mercury	mg/Kg	0.1	0.5	0.012	J	0.012	J	0.0%	**0**	0.4	Pass
nickel	mg/Kg	0.5	3	10		9.6		4.1%	0.4	2.0	Pass
potassium	mg/Kg	100	500	1120		1060		5.5%	60	400	Pass
silver	mg/Kg	3.0	15	0.045	J	0.040	J	12%	**0.005**	12.0	Pass
thallium	mg/Kg	0.5	3	0.12	J	0.11	J	8.7%	**0.01**	2.0	Pass
vanadium	mg/Kg	1.2	6	23		21		9.1%	2.0	4.8	Pass
zinc	mg/Kg	4.0	20	56		48		15%	8.0	16	Pass

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 14:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB57A**	QC Batch:	98643 -124
Sample #:	**368219**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	86
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	~~0.50 U~~ 0.17J	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

VALUE CHANGES
11/22/04

001479

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Individual sample results relate only to the sample tested.
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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**DUP-1**	QC Batch:	98643 -124
Sample #:	**368220**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	82
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U		1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U		1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	UJ,c	1.0	0.208
98-95-3	Nitrobenzene	0.50 U		0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U		0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.0704

001480

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB57B**	QC Batch:	98643 -124
Sample #:	**368221**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U		1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U		1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	UJ,C	1.0	0.208
98-95-3	Nitrobenzene	0.50 U		0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U		0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 15:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB57C**	QC Batch:	98643 -124
Sample #:	**368222**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	82
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U		1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U		1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	VJ,c	1.0	0.208
98-95-3	Nitrobenzene	0.50 U		0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U		0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB58A**	QC Batch:	98643 -124
Sample #:	**368223**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	89
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB58B**	QC Batch:	98643 -124
Sample #:	**368224**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	85
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U		1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U		1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	VJ,C	1.0	0.208
98-95-3	Nitrobenzene	0.50 U		0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U		0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB58C**	QC Batch:	98643 -124
Sample #:	**368225**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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Client:	**URS Corporation**	Sampled:	08/17/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB61A**	QC Batch:	98643 -124
Sample #:	**368226**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	88
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U		1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U		1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	UJ,C	1.0	0.190
98-95-3	Nitrobenzene	0.50 U		0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U		0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 17:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB61B**	QC Batch:	98643 -124
Sample #:	**368227**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	86
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 18:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB61C**	QC Batch:	98643 -124
Sample #:	**368228**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	79
Unit:	mg/kg dry	Dilution Factor:	1.3

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U		1.0	0.267
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.0673
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.0667
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.0946
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.128
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.115
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.0919
99-08-1	3-Nitrotoluene	1.0 U		1.0	0.150
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.0694
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.151
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	UJ,C	1.0	0.225
98-95-3	Nitrobenzene	0.50 U		0.50	0.115
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U		0.50	0.115
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.0763

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 10:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB56A**	QC Batch:	98643 -124
Sample #:	**368229**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB56B**	QC Batch:	98643 -124
Sample #:	**368230**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	UJ,C 1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB56C**	QC Batch:	98643 -124
Sample #:	**368231**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	88
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB59A**	QC Batch:	98643 -124
Sample #:	**368232**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	86
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.205
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0518
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0513
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0728
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.0987
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0884
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0707
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.115
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0534
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.116
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.173
98-95-3	Nitrobenzene	0.50 U	0.50	0.0885
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0887
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0587

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB59B**	QC Batch:	98643 -124
Sample #:	**368233**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 14:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB59C**	QC Batch:	98643 -124
Sample #:	**368234**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	85
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/25/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**DUP-2**	QC Batch:	98643 -124
Sample #:	**368235**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	85
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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Client:	**URS Corporation**	Sampled:	08/17/04 @ 14:45
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004 RFAAP SWMU 54	Analyzed:	08/27/04 by JMK1
		Anal. Method:	USEPA-8332
Sample ID:	**54SB57A**	QC Batch:	98674 -124
Sample #:	**368219**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	86
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**DUP-1**	QC Batch:	98674 -124
Sample #:	**368220**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	82
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 15:00
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004 RFAAP SWMU 54	Analyzed:	08/27/04 by JMK1
		Anal. Method:	USEPA-8332
Sample ID:	**54SB57B**	QC Batch:	98674 -124
Sample #:	**368221**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 15:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB57C**	QC Batch:	98674 -124
Sample #:	**368222**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	82
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB58A**	QC Batch:	98674 -124
Sample #:	**368223**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	89
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB58B**	QC Batch:	98674 -124
Sample #:	**368224**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	85
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB58C**	QC Batch:	98674 -124
Sample #:	**368225**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB61A**	QC Batch:	98674 -124
Sample #:	**368226**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	88
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 17:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB61B**	QC Batch:	98674 -124
Sample #:	**368227**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	86
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 18:15
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004 RFAAP SWMU 54	Analyzed:	08/27/04 by JMK1
		Anal. Method:	USEPA-8332
Sample ID:	**54SB61C**	QC Batch:	98674 -124
Sample #:	**368228**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	79
Unit:	mg/kg dry	Dilution Factor:	1.3

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.57

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 10:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB56A**	QC Batch:	98674 -124
Sample #:	**368229**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB56B**	QC Batch:	98674 -124
Sample #:	**368230**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB56C**	QC Batch:	98674 -124
Sample #:	**368231**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	88
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

001732

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB59A**	QC Batch:	98674 -124
Sample #:	**368232**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	86
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

001733

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB59B**	QC Batch:	98674 -124
Sample #:	**368233**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 14:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB59C**	QC Batch:	98674 -124
Sample #:	**368234**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	85
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-18**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**DUP-2**	QC Batch:	98674 -124
Sample #:	**368235**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	85
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 14:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/01/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB57A**	QC Batch:	99444 -123
Sample #:	**368219**	Anal. Batch:	221103
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	5.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result			Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U			20	2.77
72-55-9	4,4'-DDE	~~20 U~~	4.8 J	J,g	20	3.35
50-29-3	4,4'-DDT	~~20 U~~	26	J,g	20	3.12
309-00-2	Aldrin	20 U			20	2.61
319-84-6	Alpha-BHC	20 U			20	2.93
5103-71-9	A-Chlordane	~~20 U~~	3.1 J	J,g	20	2.60
5103-74-2	G-Chlordane	~~20 U~~	10 J		20	2.65
319-85-7	Beta-BHC	20 U			20	3.64
319-86-8	Delta-BHC	20 U			20	2.26
60-57-1	Dieldrin	20 U			20	2.73
959-98-8	Endosulfan I	20 U			20	3.04
33213-65-9	Endosulfan II	20 U			20	1.83
1031-07-8	Endosulfan Sulfate	20 U			20	3.11
72-20-8	Endrin	20 U			20	2.90
7421-93-4	Endrin Aldehyde	20 U			20	2.52
53494-70-5	Endrin Ketone	20 U			20	2.65
58-89-9	Lindane	20 U			20	3.04
76-44-8	Heptachlor	20 U			20	2.85
1024-57-3	Heptachlor Epoxide	20 U			20	4.01
72-43-5	Methoxychlor	~~20 U~~	6.3 J	J,g	20	5.41
8001-35-2	Toxaphene	320 U			320	79.5

VALUE CHANGES A 11/11/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**DUP-1**	QC Batch:	99444 -123
Sample #:	**368220**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	6.1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.92
72-55-9	4,4'-DDE	20 U	20	3.52
50-29-3	4,4'-DDT	20 U	20	3.28
309-00-2	Aldrin	20 U	20	2.75
319-84-6	Alpha-BHC	20 U	20	3.08
5103-71-9	A-Chlordane	20 U	20	2.74
5103-74-2	G-Chlordane	20 U	20	2.79
319-85-7	Beta-BHC	20 U	20	3.82
319-86-8	Delta-BHC	20 U	20	2.37
60-57-1	Dieldrin	20 U	20	2.87
959-98-8	Endosulfan I	20 U	20	3.20
33213-65-9	Endosulfan II	20 U	20	1.92
1031-07-8	Endosulfan Sulfate	20 U	20	3.28
72-20-8	Endrin	20 U	20	3.05
7421-93-4	Endrin Aldehyde	20 U	20	2.65
53494-70-5	Endrin Ketone	20 U	20	2.79
58-89-9	Lindane	20 U	20	3.20
76-44-8	Heptachlor	20 U	20	3.00
1024-57-3	Heptachlor Epoxide	20 U	20	4.22
72-43-5	Methoxychlor	20 U	20	5.69
8001-35-2	Toxaphene	320 U	320	83.6

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/24/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB57B**	QC Batch:	99444 -123
Sample #:	**368221**	Anal. Batch:	222042
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	UJ,c	20	2.87
72-55-9	4,4'-DDE	20 U		20	3.46
50-29-3	4,4'-DDT	20 U		20	3.23
309-00-2	Aldrin	20 U		20	2.70
319-84-6	Alpha-BHC	20 U		20	3.03
5103-71-9	A-Chlordane	20 U		20	2.69
5103-74-2	G-Chlordane	20 U		20	2.74
319-85-7	Beta-BHC	20 U		20	3.76
319-86-8	Delta-BHC	20 U		20	2.33
60-57-1	Dieldrin	20 U		20	2.83
959-98-8	Endosulfan I	20 U		20	3.14
33213-65-9	Endosulfan II	20 U		20	1.89
1031-07-8	Endosulfan Sulfate	20 U		20	3.22
72-20-8	Endrin	20 U		20	3.00
7421-93-4	Endrin Aldehyde	20 U		20	2.60
53494-70-5	Endrin Ketone	20 U		20	2.74
58-89-9	Lindane	20 U		20	3.14
76-44-8	Heptachlor	20 U		20	2.95
1024-57-3	Heptachlor Epoxide	20 U		20	4.15
72-43-5	Methoxychlor	20 U	UJ,c	20	5.60
8001-35-2	Toxaphene	320 U		320	82.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 15:30
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004 RFAAP SWMU 54	Analyzed:	09/22/04 by MSN
		Anal. Method:	USEPA-8081A
Sample ID:	**54SB57C**	QC Batch:	99444 -123
Sample #:	**368222**	Anal. Batch:	221995
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	6.1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.92
72-55-9	4,4'-DDE	20 U	20	3.52
50-29-3	4,4'-DDT	20 U	20	3.28
309-00-2	Aldrin	20 U	20	2.75
319-84-6	Alpha-BHC	20 U	20	3.08
5103-71-9	A-Chlordane	20 U	20	2.74
5103-74-2	G-Chlordane	20 U	20	2.79
319-85-7	Beta-BHC	20 U	20	3.82
319-86-8	Delta-BHC	20 U	20	2.37
60-57-1	Dieldrin	20 U	20	2.87
959-98-8	Endosulfan I	20 U	20	3.20
33213-65-9	Endosulfan II	20 U	20	1.92
1031-07-8	Endosulfan Sulfate	20 U	20	3.28
72-20-8	Endrin	20 U	20	3.05
7421-93-4	Endrin Aldehyde	20 U	20	2.65
53494-70-5	Endrin Ketone	20 U	20	2.79
58-89-9	Lindane	20 U	20	3.20
76-44-8	Heptachlor	20 U	20	3.00
1024-57-3	Heptachlor Epoxide	20 U	20	4.22
72-43-5	Methoxychlor	20 U	20	5.69
8001-35-2	Toxaphene	320 U	320	83.6

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/01/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB58A**	QC Batch:	99444 -123
Sample #:	**368223**	Anal. Batch:	221103
Matrix:	Soil	Percent Solids:	89
Unit:	ug/kg dry	Dilution Factor:	5.6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.68
72-55-9	4,4'-DDE	20 U	20	3.23
50-29-3	4,4'-DDT	20 U	20	3.01
309-00-2	Aldrin	20 U	20	2.52
319-84-6	Alpha-BHC	20 U	20	2.83
5103-71-9	A-Chlordane	20 U	20	2.51
5103-74-2	G-Chlordane	20 U	20	2.56
319-85-7	Beta-BHC	20 U	20	3.51
319-86-8	Delta-BHC	20 U	20	2.18
60-57-1	Dieldrin	20 U	20	2.64
959-98-8	Endosulfan I	20 U	20	2.93
33213-65-9	Endosulfan II	20 U	20	1.76
1031-07-8	Endosulfan Sulfate	20 U	20	3.01
72-20-8	Endrin	20 U	20	2.80
7421-93-4	Endrin Aldehyde	20 U	20	2.43
53494-70-5	Endrin Ketone	20 U	20	2.56
58-89-9	Lindane	20 U	20	2.93
76-44-8	Heptachlor	20 U	20	2.76
1024-57-3	Heptachlor Epoxide	20 U	20	3.88
72-43-5	Methoxychlor	20 U	20	5.22
8001-35-2	Toxaphene	320 U	320	76.7

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/02/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB58B**	QC Batch:	99444 -123
Sample #:	**368224**	Anal. Batch:	221103
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	5.9

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.82
72-55-9	4,4'-DDE	20 U	20	3.40
50-29-3	4,4'-DDT	20 U	20	3.17
309-00-2	Aldrin	20 U	20	2.66
319-84-6	Alpha-BHC	20 U	20	2.98
5103-71-9	A-Chlordane	20 U	20	2.65
5103-74-2	G-Chlordane	20 U	20	2.70
319-85-7	Beta-BHC	20 U	20	3.70
319-86-8	Delta-BHC	20 U	20	2.30
60-57-1	Dieldrin	20 U	20	2.78
959-98-8	Endosulfan I	20 U	20	3.09
33213-65-9	Endosulfan II	20 U	20	1.86
1031-07-8	Endosulfan Sulfate	20 U	20	3.17
72-20-8	Endrin	20 U	20	2.95
7421-93-4	Endrin Aldehyde	20 U	20	2.56
53494-70-5	Endrin Ketone	20 U	20	2.70
58-89-9	Lindane	20 U	20	3.09
76-44-8	Heptachlor	20 U	20	2.90
1024-57-3	Heptachlor Epoxide	20 U	20	4.08
72-43-5	Methoxychlor	20 U	20	5.50
8001-35-2	Toxaphene	320 U	320	80.8

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/02/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB58C**	QC Batch:	99444 -123
Sample #:	**368225**	Anal. Batch:	221103
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.87
72-55-9	4,4'-DDE	20 U	20	3.46
50-29-3	4,4'-DDT	20 U	20	3.23
309-00-2	Aldrin	20 U	20	2.70
319-84-6	Alpha-BHC	20 U	20	3.03
5103-71-9	A-Chlordane	20 U	20	2.69
5103-74-2	G-Chlordane	20 U	20	2.74
319-85-7	Beta-BHC	20 U	20	3.76
319-86-8	Delta-BHC	20 U	20	2.33
60-57-1	Dieldrin	20 U	20	2.83
959-98-8	Endosulfan I	20 U	20	3.14
33213-65-9	Endosulfan II	20 U	20	1.89
1031-07-8	Endosulfan Sulfate	20 U	20	3.22
72-20-8	Endrin	20 U	20	3.00
7421-93-4	Endrin Aldehyde	20 U	20	2.60
53494-70-5	Endrin Ketone	20 U	20	2.74
58-89-9	Lindane	20 U	20	3.14
76-44-8	Heptachlor	20 U	20	2.95
1024-57-3	Heptachlor Epoxide	20 U	20	4.15
72-43-5	Methoxychlor	20 U	20	5.60
8001-35-2	Toxaphene	320 U	320	82.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/02/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB61A**	QC Batch:	99444 -123
Sample #:	**368226**	Anal. Batch:	221103
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.72
72-55-9	4,4'-DDE	20 U	20	3.29
50-29-3	4,4'-DDT	20 U	20	3.07
309-00-2	Aldrin	20 U	20	2.57
319-84-6	Alpha-BHC	20 U	20	2.88
5103-71-9	A-Chlordane	20 U	20	2.56
5103-74-2	G-Chlordane	20 U	20	2.60
319-85-7	Beta-BHC	20 U	20	3.57
319-86-8	Delta-BHC	20 U	20	2.22
60-57-1	Dieldrin	20 U	20	2.68
959-98-8	Endosulfan I	20 U	20	2.99
33213-65-9	Endosulfan II	20 U	20	1.80
1031-07-8	Endosulfan Sulfate	20 U	20	3.06
72-20-8	Endrin	20 U	20	2.85
7421-93-4	Endrin Aldehyde	20 U	20	2.47
53494-70-5	Endrin Ketone	20 U	20	2.60
58-89-9	Lindane	20 U	20	2.99
76-44-8	Heptachlor	20 U	20	2.80
1024-57-3	Heptachlor Epoxide	20 U	20	3.94
72-43-5	Methoxychlor	20 U	20	5.32
8001-35-2	Toxaphene	320 U	320	78.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 17:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB61B**	QC Batch:	99444 -123
Sample #:	**368227**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	5.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.73
72-55-9	4,4'-DDE	20 U	20	2.44
50-29-3	4,4'-DDT	20 U	20	2.52
309-00-2	Aldrin	20 U	20	1.87
319-84-6	Alpha-BHC	20 U	20	1.89
5103-71-9	A-Chlordane	20 U	20	2.06
5103-74-2	G-Chlordane	20 U	20	2.30
319-85-7	Beta-BHC	20 U	20	2.31
319-86-8	Delta-BHC	20 U	20	2.37
60-57-1	Dieldrin	20 U	20	2.38
959-98-8	Endosulfan I	20 U	20	1.14
33213-65-9	Endosulfan II	20 U	20	1.21
1031-07-8	Endosulfan Sulfate	20 U	20	2.50
72-20-8	Endrin	20 U	20	3.25
7421-93-4	Endrin Aldehyde	20 U	20	3.88
53494-70-5	Endrin Ketone	20 U	20	3.79
58-89-9	Lindane	20 U	20	1.80
76-44-8	Heptachlor	20 U	20	1.82
1024-57-3	Heptachlor Epoxide	20 U	20	2.08
72-43-5	Methoxychlor	20 U	20	2.88
8001-35-2	Toxaphene	320 U	320	65.5

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 18:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB61C**	QC Batch:	99444 -123
Sample #:	**368228**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	6.3

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.96
72-55-9	4,4'-DDE	20 U	20	2.65
50-29-3	4,4'-DDT	20 U	20	2.74
309-00-2	Aldrin	20 U	20	2.03
319-84-6	Alpha-BHC	20 U	20	2.05
5103-71-9	A-Chlordane	20 U	20	2.24
5103-74-2	G-Chlordane	20 U	20	2.50
319-85-7	Beta-BHC	20 U	20	2.51
319-86-8	Delta-BHC	20 U	20	2.58
60-57-1	Dieldrin	20 U	20	2.58
959-98-8	Endosulfan I	20 U	20	1.23
33213-65-9	Endosulfan II	20 U	20	1.32
1031-07-8	Endosulfan Sulfate	20 U	20	2.72
72-20-8	Endrin	20 U	20	3.53
7421-93-4	Endrin Aldehyde	20 U	20	4.21
53494-70-5	Endrin Ketone	20 U	20	4.12
58-89-9	Lindane	20 U	20	1.96
76-44-8	Heptachlor	20 U	20	1.97
1024-57-3	Heptachlor Epoxide	20 U	20	2.26
72-43-5	Methoxychlor	20 U	20	3.13
8001-35-2	Toxaphene	320 U	320	71.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 10:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB56A**	QC Batch:	99444 -123
Sample #:	**368229**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.82
72-55-9	4,4'-DDE	20 U	20	2.52
50-29-3	4,4'-DDT	20 U	20	2.61
309-00-2	Aldrin	20 U	20	1.93
319-84-6	Alpha-BHC	20 U	20	1.96
5103-71-9	A-Chlordane	20 U	20	2.14
5103-74-2	G-Chlordane	20 U	20	2.38
319-85-7	Beta-BHC	20 U	20	2.39
319-86-8	Delta-BHC	20 U	20	2.45
60-57-1	Dieldrin	20 U	20	2.46
959-98-8	Endosulfan I	20 U	20	1.18
33213-65-9	Endosulfan II	20 U	20	1.25
1031-07-8	Endosulfan Sulfate	20 U	20	2.59
72-20-8	Endrin	20 U	20	3.36
7421-93-4	Endrin Aldehyde	20 U	20	4.01
53494-70-5	Endrin Ketone	20 U	20	3.92
58-89-9	Lindane	20 U	20	1.87
76-44-8	Heptachlor	20 U	20	1.88
1024-57-3	Heptachlor Epoxide	20 U	20	2.15
72-43-5	Methoxychlor	20 U	20	2.98
8001-35-2	Toxaphene	320 U	320	67.8

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB56B**	QC Batch:	99444 -123
Sample #:	**368230**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.68
72-55-9	4,4'-DDE	20 U	20	2.39
50-29-3	4,4'-DDT	20 U	20	2.48
309-00-2	Aldrin	20 U	20	1.84
319-84-6	Alpha-BHC	20 U	20	1.86
5103-71-9	A-Chlordane	20 U	20	2.03
5103-74-2	G-Chlordane	20 U	20	2.26
319-85-7	Beta-BHC	20 U	20	2.27
319-86-8	Delta-BHC	20 U	20	2.33
60-57-1	Dieldrin	20 U	20	2.34
959-98-8	Endosulfan I	20 U	20	1.12
33213-65-9	Endosulfan II	20 U	20	1.19
1031-07-8	Endosulfan Sulfate	20 U	20	2.46
72-20-8	Endrin	20 U	20	3.19
7421-93-4	Endrin Aldehyde	20 U	20	3.81
53494-70-5	Endrin Ketone	20 U	20	3.73
58-89-9	Lindane	20 U	20	1.77
76-44-8	Heptachlor	20 U	20	1.78
1024-57-3	Heptachlor Epoxide	20 U	20	2.05
72-43-5	Methoxychlor	20 U	20	2.83
8001-35-2	Toxaphene	320 U	320	64.4

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Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB56C**	QC Batch:	99444 -123
Sample #:	**368231**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.68
72-55-9	4,4'-DDE	20 U	20	2.39
50-29-3	4,4'-DDT	20 U	20	2.48
309-00-2	Aldrin	20 U	20	1.84
319-84-6	Alpha-BHC	20 U	20	1.86
5103-71-9	A-Chlordane	20 U	20	2.03
5103-74-2	G-Chlordane	20 U	20	2.26
319-85-7	Beta-BHC	20 U	20	2.27
319-86-8	Delta-BHC	20 U	20	2.33
60-57-1	Dieldrin	20 U	20	2.34
959-98-8	Endosulfan I	20 U	20	1.12
33213-65-9	Endosulfan II	20 U	20	1.19
1031-07-8	Endosulfan Sulfate	20 U	20	2.46
72-20-8	Endrin	20 U	20	3.19
7421-93-4	Endrin Aldehyde	20 U	20	3.81
53494-70-5	Endrin Ketone	20 U	20	3.73
58-89-9	Lindane	20 U	20	1.77
76-44-8	Heptachlor	20 U	20	1.78
1024-57-3	Heptachlor Epoxide	20 U	20	2.05
72-43-5	Methoxychlor	20 U	20	2.83
8001-35-2	Toxaphene	320 U	320	64.4

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB59A**	QC Batch:	99444 -123
Sample #:	**368232**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	5.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.73
72-55-9	4,4'-DDE	20 U	20	2.44
50-29-3	4,4'-DDT	20 U	20	2.52
309-00-2	Aldrin	20 U	20	1.87
319-84-6	Alpha-BHC	20 U	20	1.89
5103-71-9	A-Chlordane	20 U	20	2.06
5103-74-2	G-Chlordane	20 U	20	2.30
319-85-7	Beta-BHC	20 U	20	2.31
319-86-8	Delta-BHC	20 U	20	2.37
60-57-1	Dieldrin	20 U	20	2.38
959-98-8	Endosulfan I	20 U	20	1.14
33213-65-9	Endosulfan II	20 U	20	1.21
1031-07-8	Endosulfan Sulfate	20 U	20	2.50
72-20-8	Endrin	20 U	20	3.25
7421-93-4	Endrin Aldehyde	20 U	20	3.88
53494-70-5	Endrin Ketone	20 U	20	3.79
58-89-9	Lindane	20 U	20	1.80
76-44-8	Heptachlor	20 U	20	1.82
1024-57-3	Heptachlor Epoxide	20 U	20	2.08
72-43-5	Methoxychlor	20 U	20	2.88
8001-35-2	Toxaphene	320 U	320	65.5

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB59B**	QC Batch:	99444 -123
Sample #:	**368233**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.68
72-55-9	4,4'-DDE	20 U	20	2.39
50-29-3	4,4'-DDT	20 U	20	2.48
309-00-2	Aldrin	20 U	20	1.84
319-84-6	Alpha-BHC	20 U	20	1.86
5103-71-9	A-Chlordane	20 U	20	2.03
5103-74-2	G-Chlordane	20 U	20	2.26
319-85-7	Beta-BHC	20 U	20	2.27
319-86-8	Delta-BHC	20 U	20	2.33
60-57-1	Dieldrin	20 U	20	2.34
959-98-8	Endosulfan I	20 U	20	1.12
33213-65-9	Endosulfan II	20 U	20	1.19
1031-07-8	Endosulfan Sulfate	20 U	20	2.46
72-20-8	Endrin	20 U	20	3.19
7421-93-4	Endrin Aldehyde	20 U	20	3.81
53494-70-5	Endrin Ketone	20 U	20	3.73
58-89-9	Lindane	20 U	20	1.77
76-44-8	Heptachlor	20 U	20	1.78
1024-57-3	Heptachlor Epoxide	20 U	20	2.05
72-43-5	Methoxychlor	20 U	20	2.83
8001-35-2	Toxaphene	320 U	320	64.4

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 14:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB59C**	QC Batch:	99444 -123
Sample #:	**368234**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	5.9

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.77
72-55-9	4,4'-DDE	20 U	20	2.48
50-29-3	4,4'-DDT	20 U	20	2.57
309-00-2	Aldrin	20 U	20	1.90
319-84-6	Alpha-BHC	20 U	20	1.92
5103-71-9	A-Chlordane	20 U	20	2.10
5103-74-2	G-Chlordane	20 U	20	2.34
319-85-7	Beta-BHC	20 U	20	2.35
319-86-8	Delta-BHC	20 U	20	2.41
60-57-1	Dieldrin	20 U	20	2.42
959-98-8	Endosulfan I	20 U	20	1.16
33213-65-9	Endosulfan II	20 U	20	1.23
1031-07-8	Endosulfan Sulfate	20 U	20	2.54
72-20-8	Endrin	20 U	20	3.30
7421-93-4	Endrin Aldehyde	20 U	20	3.95
53494-70-5	Endrin Ketone	20 U	20	3.86
58-89-9	Lindane	20 U	20	1.83
76-44-8	Heptachlor	20 U	20	1.85
1024-57-3	Heptachlor Epoxide	20 U	20	2.12
72-43-5	Methoxychlor	20 U	20	2.93
8001-35-2	Toxaphene	320 U	320	66.7

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**DUP-2**	QC Batch:	99444 -123
Sample #:	**368235**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	5.9

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.77
72-55-9	4,4'-DDE	20 U	20	2.48
50-29-3	4,4'-DDT	20 U	20	2.57
309-00-2	Aldrin	20 U	20	1.90
319-84-6	Alpha-BHC	20 U	20	1.92
5103-71-9	A-Chlordane	20 U	20	2.10
5103-74-2	G-Chlordane	20 U	20	2.34
319-85-7	Beta-BHC	20 U	20	2.35
319-86-8	Delta-BHC	20 U	20	2.41
60-57-1	Dieldrin	20 U	20	2.42
959-98-8	Endosulfan I	20 U	20	1.16
33213-65-9	Endosulfan II	20 U	20	1.23
1031-07-8	Endosulfan Sulfate	20 U	20	2.54
72-20-8	Endrin	20 U	20	3.30
7421-93-4	Endrin Aldehyde	20 U	20	3.95
53494-70-5	Endrin Ketone	20 U	20	3.86
58-89-9	Lindane	20 U	20	1.83
76-44-8	Heptachlor	20 U	20	1.85
1024-57-3	Heptachlor Epoxide	20 U	20	2.12
72-43-5	Methoxychlor	20 U	20	2.93
8001-35-2	Toxaphene	320 U	320	66.7

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 14:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB57A**	QC Batch:	98725 -123
Sample #:	**368219**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	**PCB-1254**	**180**	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**DUP-1**	QC Batch:	98725 -123
Sample #:	**368220**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB57B**	QC Batch:	98725 -123
Sample #:	**368221**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 15:30
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004 RFAAP SWMU 54	Analyzed:	08/27/04 by JLRM
		Anal. Method:	USEPA-8082
Sample ID:	**54SB57C**	QC Batch:	98725 -123
Sample #:	**368222**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB58A**	QC Batch:	98725 -123
Sample #:	**368223**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	89
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB58B**	QC Batch:	98725 -123
Sample #:	**368224**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB58C**	QC Batch:	98725 -123
Sample #:	**368225**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB61A**	QC Batch:	98725 -123
Sample #:	**368226**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 17:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB61B**	QC Batch:	98725 -123
Sample #:	**368227**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 18:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB61C**	QC Batch:	98725 -123
Sample #:	**368228**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	10.5
11104-28-2	PCB-1221	66 U	66	12.2
11141-16-5	PCB-1232	66 U	66	10.8
53469-21-9	PCB-1242	33 U	33	7.28
12672-29-6	PCB-1248	33 U	33	6.89
11097-69-1	PCB-1254	33 U	33	8.84
11096-82-5	PCB-1260	66 U	66	13.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 10:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB56A**	QC Batch:	98725 -123
Sample #:	**368229**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB56B**	QC Batch:	98725 -123
Sample #:	**368230**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB56C**	QC Batch:	98725 -123
Sample #:	**368231**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB59A**	QC Batch:	98725 -123
Sample #:	**368232**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB59B**	QC Batch:	98725 -123
Sample #:	**368233**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 14:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/27/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB59C**	QC Batch:	98725 -123
Sample #:	**368234**	Anal. Batch:	220850
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-18**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 17-18, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**DUP-2**	QC Batch:	98725 -123
Sample #:	**368235**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

End of Analytical Report

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 14:45
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB57A**
Sample #: **368219**
Matrix: Soil

Percent Solids: 86

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	16400		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.30 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	1.4		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	142		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.21 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.6		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	6530		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	25		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	16	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	18		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	25600		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	63		10	DF 10 0.776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	5000		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	850		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.050 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	12	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1810		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.089 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	76 J		100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.20 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	44		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	103	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 00:00
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **DUP-1**
Sample #: **368220**
Matrix: Soil

Percent Solids: 82

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	11300	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.050 J	0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.75	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	128	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.26 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.5	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1590	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	20	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	8.5 J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	9.2	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	19200	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	8.8	1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3030	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	403	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.014 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	12 J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1320	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.060 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	113	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.14 J	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	27	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	57 J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 15:00
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB57B**
Sample #: **368221**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	13400		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.057 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.92		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	143		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.33 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.5		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1760		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	22		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
* Cobalt, Total	11	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	11		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	22500		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	9.7		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3490		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	562		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.016 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
* Nickel, Total	13	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1490		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
* Selenium, Total	0.11 J		1.0	0.0486	mg/kg dry	09/10/04	DSC	USEPA-6020
Silver, Total	0.061 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	138		100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.17 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	32		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
* Zinc, Total	66	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 15:30
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB57C**
Sample #: **368222**
Matrix: Soil

Percent Solids: 82

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	11900	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.077 J	0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.85	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	140	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.33 J	1.0	0 0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.4	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1650	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	20	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	9.1 J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	10	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	20200	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	11	1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3200	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	454	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.017 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	13 J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1360	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.48 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	102	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.16 J	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	29	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	76 J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 16:30
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB58A**
Sample #: **368223**
Matrix: Soil

Percent Solids: 89

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	7150		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.068 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.84		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	116		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.22 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.4		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1930		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	13		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	6.0	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	7.2		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	14600		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	29		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2120		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	428		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.021 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	8.6	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1320		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.057 J		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.052 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	38 J	B,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.16 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	18		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	104	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 16:40
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB58B**
Sample #: **368224**
Matrix: Soil

Percent Solids: 85

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	9150		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.055 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.72		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	113		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.28 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.5		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1550		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	17		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	7.3	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	8.1		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	16200		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	8.1		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2560		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	376		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.014 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	11	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1310		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.050 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	32 J	B,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.13 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	22		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	54	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 16:55
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB58C**
Sample #: **368225**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	10500		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.068 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.75		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	114		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.35 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.6		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1630		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	18		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	8.5	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	9.9		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	18900		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	8.5		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2990		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	473		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.015 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	12	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1150		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.061 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	74 J	B,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.14 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	25		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	65	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 17:45
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB61A**
Sample #: **368226**
Matrix: Soil

Percent Solids: 88

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	6620		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.040 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.67		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	119		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.23 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.3		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1140		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	12		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	6.0	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	7.6		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	13700		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	17		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2040		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	483		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.017 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	8.6	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	955		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.049 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	69 J	B,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.12 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	16		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	87	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 17:55
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB61B**
Sample #: **368227**
Matrix: Soil

Percent Solids: 86

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	7670		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.069 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.64		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	95		5.0	0.103	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Beryllium, Total	0.26 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.4		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1270		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	13		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	6.4	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	7.3		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	14400		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	6.9		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2290		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	368		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.012 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	9.6	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	940		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.047 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	72 J	B,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.10 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	18		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	51	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 18:15
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB61C**
Sample #: **368228**
Matrix: Soil

Percent Solids: 79

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	14500		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.068 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.94		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	161		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.47 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.5		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	2060		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	22		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	11	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	14		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	23300		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	9.9		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3570		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	672		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.020 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	15	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1290		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.072 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	79 J	B,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.19 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	32		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	77	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 10:50
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB56A**
Sample #: **368229**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	13300		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.17 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	2.5		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	175		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.20 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.5		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1390		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	19		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	11	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	16		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	38800		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	265		50 DF50	3.88	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	2580		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	1520		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.043 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	12	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1390		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.14 J		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.12 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	72 J	B,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.92		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	32		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	833	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 11:20
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB56B**
Sample #: **368230**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	7730		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.53		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	100		5.0	0.103	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Beryllium, Total	0.36 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.3		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1520		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	14		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	6.5	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	6.4		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	13200		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	6.4		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2100		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	342		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.013 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	9.4	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	778		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.044 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	69 J	B,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.10 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	19		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	52	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 11:40
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB56C**
Sample #: **368231**
Matrix: Soil

Percent Solids: 88

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	7410		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.60		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	84		5.0	0.103	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Beryllium, Total	0.30 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.3		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1370		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	15		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	6.0	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	6.5		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	13500		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	28		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2080		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	344		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.013 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	9.3	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	798		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.050 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	71 J	B,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.13 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	20		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	86	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 11:50
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB59A**
Sample #: **368232**
Matrix: Soil

Percent Solids: 86

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	9570		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.058 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.79		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	118		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.40 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.6		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1720		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	17		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	7.6	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	8.8		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	17000		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	20		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2530		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	515		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.021 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	11	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	962		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.055 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	72 J	B,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.17 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	21		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	101	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 14:00
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB59B**
Sample #: **368233**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	5620		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.38 J		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	59		5.0	0.103	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Beryllium, Total	0.20 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.0		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	949		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	11		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	4.8	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	4.3 J		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	10500		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	4.4		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	1800		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	224		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.10 U		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	6.9	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	881		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.32 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	UL,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.50 U		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	15		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	39	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

000099

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 14:20
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB59C**
Sample #: **368234**
Matrix: Soil

Percent Solids: 85

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	9760		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.041 J		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.58		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	108		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.40 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.5		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1520		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	18		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	7.7	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	7.8		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	15600		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	7.9		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2690		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	398		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.012 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	10	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1120		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.045 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	UL,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.12 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	23		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	56	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

000100

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 00:00
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **DUP-2**
Sample #: **368235**
Matrix: Soil

Percent Solids: 85

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	8760		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.52		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	93		5.0	0.103	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Beryllium, Total	0.32 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.4		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1380		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	16		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	6.8	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	7.5		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	14300		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	6.2		1.0	0.0776	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2460		250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	354		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.012 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	9.6	J,S	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1060		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.040 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	UL,O	100	31.4	mg/kg dry	09/02/04	DSC	USEPA-6010B
Thallium, Total	0.11 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	21		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	48	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

000101

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 14:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB57A**		
Sample #:	**368219**		
Matrix:	Soil	Percent Solids:	86

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	86	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003214

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**DUP-1**		
Sample #:	**368220**		
Matrix:	Soil	Percent Solids:	82

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	82	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003215

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 15:00
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB57B**
Sample #: **368221**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	83	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003216

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 15:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB57C**		
Sample #:	**368222**		
Matrix:	Soil	Percent Solids:	82

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	82	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003217

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB58A**		
Sample #:	**368223**		
Matrix:	Soil	Percent Solids:	89

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	89	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003218

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 16:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB58B**		
Sample #:	**368224**		
Matrix:	Soil	Percent Solids:	85

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	85	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003219

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/17/04 @ 16:55
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB58C**
Sample #: **368225**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	83	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003220

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB61A**		
Sample #:	**368226**		
Matrix:	Soil	Percent Solids:	88

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	88	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 17:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB61B**		
Sample #:	**368227**		
Matrix:	Soil	Percent Solids:	86

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	86	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003222

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/17/04 @ 18:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB61C**		
Sample #:	**368228**		
Matrix:	Soil	Percent Solids:	79

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	79	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003223

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 10:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB56A**		
Sample #:	**368229**		
Matrix:	Soil	Percent Solids:	84

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	84	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003224

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 11:20
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB56B**
Sample #: **368230**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	87	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003225

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB56C**		
Sample #:	**368231**		
Matrix:	Soil	Percent Solids:	88

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	88	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003226

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 11:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB59A**		
Sample #:	**368232**		
Matrix:	Soil	Percent Solids:	86

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	86	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003227

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 09:00
Submittal #:	**36440-18**		
Submittal:	Soil, Aug 17-18, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB59B**		
Sample #:	**368233**		
Matrix:	Soil	Percent Solids:	87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	87	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003228

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 14:20
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **54SB59C**
Sample #: **368234**
Matrix: Soil

Percent Solids: 85

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	85	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003229

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 00:00
Sampler: D. Copen
Received: 08/19/04 @ 09:00

Submittal #: **36440-18**
Submittal: Soil, Aug 17-18, 2004
RFAAP SWMU 54
Sample ID: **DUP-2**
Sample #: **368235**
Matrix: Soil

Percent Solids: 85

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	85	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003230

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DATA VALIDATION WORKSHEET

Reviewer: Andrea Sansom
Date: 11/8/2004
DV Level: II III IV
Review Document:
_X_ Region III Modified for National Functional Guidelines
___ NFG for organic Data review (February 1994)
_X_ Project QAPP/SAP

Explosives

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-18
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	X		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids (for		X	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: *The chain of custody and the sample container label had a different collection time for sample 54SB59B. As directed from the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.*

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: *Two coolers at 1.9C and 4.2C.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	X		

Notes: *EQB-1, EQB-2, and EQB-3 are non-detect*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		X	
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?		X	
6.4	Are there any RPD for MS/MSD recoveries outside the QC limits not to exceed 60%?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 54SB57B MS MSD RPD

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			X
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54SB57C and DUP-1*
54SB59C and DUP-2

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	X		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.			X
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		X		
	Number of samples:	17			
	Number of target compounds in each analysis:	14			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: Andrea Sansom
Date: 11/8/2004
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-18
Test Name: Nitroglycerin
Method No.: 8330-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids (for		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes: *The chain of custody and the sample container label had a different collection time for sample 54SB59B. As directed from the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.*

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	X		
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: *Two coolers at **1.9C** and 4.2C.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	X		

Notes: *EQB-1, EQB-2, and EQB-3 are non-detect*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: *54SB57B*

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54SB57C and DUP-1*
54SB59C and DUP-2

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 17			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: Andrea Sansom
Date: November 8, 2004
DV Level: II III IV

Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-18
Test Name: PEST/PCB
Method No.: 8081A/8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Do any soil samples contain more than 50% water?	X		
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes: *The chain of custody and the sample container label had a different collection time for sample 54SB59B. As directed from the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.*

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		X	

Notes: *Two coolers at **1.9C** and 4.2C.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	X		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	X		

Notes: *EQB-1, EQB-2, EQB-3, & EQB-4 are non-detect*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	X		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	X		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		Pest	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows? If No, the associated sample result should be carefully evaluated.	X		

Notes:

5.0 GC/ECD Instrument Performance Check for Pesticides		Yes	No	NA
5.1	Is the 4,4'-DDT breakdown </= to 15%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	X		
5.2	Is the endrin breakdown </= to 15%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	X		

Notes:

6.0 Surrogate Recovery					Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?				X		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.				X		
6.3	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?				X		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?						X
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)						X
	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance			
	1 out	high/low	No action	No action			
	2 out	2 high same column	K	No action			
		2 low same column	L, UL	No action			
		mixed same column	J, UJ	No action			
		2 high diff columns	J	Not applicable			
		2 low diff columns	J, UJ	Not applicable			
		mixed diff columns	Professional judgement	Not applicable			
	3 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		2 high, 1 low	K (2 high)	J (1 low 2nd column)			
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)			
		other mixed	J, UJ	Not applicable			
	4 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		Mixed	J, UJ	Not applicable			
	If any recovery is >0% and <10% then L(+)/R(-).						
	If any recovery is 0% then R(+/-).						

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 30-150%?		X	
7.4	Are there any RPDs outside the QC limits not to exceed 60%?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: *54SB57B*

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	X		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 30-150%?		X	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			X
	If Yes, J(+) only.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54SB57C and DUP-1*
54SB59C and DUP-2

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		Pest	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	X		

Notes:

11.0 Pesticide Cleanup Checks		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes: *CLP requirement, not provided*

Case narrative indicates mercury was used to remove sulfur due to the possibility of degradation of some pesticide target analytes with use of the recommended cleanup with activated copper.

12.0 Data Completeness				Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	Pest	PCB	X		
	Number of samples:	17	17			
	Number of target compounds in each analysis:	21	7			
	Number of results rejected and not reported:	0	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)					
	% Completeness =	100%	100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP/ICPMS/CVAA
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-18
Project No.: 21355035.20001

Project Name: Radford SWMU54
Reviewer: Andrea Sansom
Date: 10/29/2004

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	x			x			x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x			x			x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x			x			x		
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)		x			x			x	
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	x			x			x		

Note: *The chain of custody and the sample container label had a different collection time for sample 54SB59B. As directed from the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.*

*Two coolers at **1.9C** and 4.2C.*

2.0 Holding Time		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		x			x			x	

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".	7+BLK			4+BLK			5+BLK		
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).	x			x			x		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	x			x			x		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based	x			x			x		
3.5	Were ICV/CCV reported from mutiple exposures (3 for ICP or 2 for CVAA) with passing %RSD (ICP < 5% or CVAA < 10%)? If no, contact project chemist for laboratory resolution.	x			x			x		
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP: 90%-110% & Hg: 80-120%	x			x			x		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%									
3.7	For one point curves on ICP & ICPMS, did the CRDL standard recover between 80-120%?			x			x	105%		
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K									

Note: *TriMatrix incorporated a higher calibration standard to limit the number of required analytical dilutions for Al, Ba, Ca, Fe, Mn, and K.*

TriMatrix felt this would affect the low end of the curve creating more error at the non-detect detection limit of an acceptable CCB or MB.

TriMatrix elevated these reporting limits by a factor of five for this reason, while still meeting the project DQOs.

URS requested a new MDL study or processing through the new curve and/or to elevate the MDL as well.

Evaluation of the CCBs and MB was performed down to the MDL for both positive and negative detections.

4.0 Blanks

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	x			x			x		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	x			x			x		
4.3	Are there reported MB or ICB/CCBs values > MDL?		x		x				x	
	Sample Results > MDL									
	< 5X Blank Contamination B									
4.4	Are there negative blank results with the absolute value > MDL?		x		x				x	
	Sample Results Non-detects > MDL									
	< 5X absolute Blank Contamination UL L									
4.5	Are there reported field blank > ± MDL?	x			x				x	
	Sample Results > MDL									
	< 5X Blank Contamination B									

Note:

EQB-1 Sb 0.986 ug/L J B,o

Fe 13.93 ug/L J

EQB-2 Non-detect

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	x			x					
5.2	Are the ICS AB recoveries within 80% - 120%?	x			x					
5.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		x			x				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?		x			x				
	If not...									
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)									

Note:

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	X			X			X		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		X			X			X	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)									

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	X			X			X		
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.									
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	X			X			X		

Note: *54SB57B*

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	x			x			x		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?									
	%R > 125% 30%< %R < 74% < 30%	x			x			x		
	Positive K L L									
	Non-detect None UL R									
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.		Se		x					x

Note: *54SB57B - passed, PDS by 6020 for Se low @ 70%*

Selenium for this sample was reported by MSA.

9.0 Instrument Detection Limits (IDL)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	x			x			x		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	x			x					
10.2	Was a five-fold dilution performed?	x			x					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).		x			x				

Note: *54SB57B -Co by 6010B @ 14%, Ni by 6020 @ 15%, Zn by 6010B @ 12%*

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	x			x			x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.									
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report	x			x			x		

Note: *54SB57C and DUP-1*

54SB59C and DUP-2

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	x			x			x		
12.2	Were all dilutions reflected in the positive results and detection limits?	x					x			x
12.3	Were the Internal Standard recoveries within 30-120% (6020) or 80-120% (6010B)?	x			x					
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	x								
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	x								
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	x								

Note:

13.0 Completeness Calculation		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	x			x			x		
13.1.1	Number of samples: 17									
13.1.2	Number of target compounds in each analysis: 23									
13.1.3	Number of results rejected and not reported: 0									
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%									

Note:

Radford Army Ammunition Plant
Chain of Custody Record

pg 1 of 2 — Cart 8 — 1264 → WR — 7Jno264

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000028

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA Code	Matrix Code	Test Group	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
54SB57A	8-17-04	1445	S	X		1	W	U	2				X	X	X										SO	N	1	44	368219
DUP-1	8-17-04	—	S	X		1	W	U	2				X	X	X										SO	N	1	44	368220
54SB57B & MS D	8-17-04	1500	S	X		1	W	U	5				X	X	X										SO	N	1	44	368221
54SB57C	8-17-04	1530	S	X		1	W	U	2				X	X	X										SO	N	1	44	368222
54SB58A	8-17-04	1630	S	X		1	W	U	2				X	X	X										SO	N	1	44	368223
54SB58B	8-17-04	1640	S	X		1	W	U	2				X	X	X										SO	N	1	44	368224
54SB58C	8-17-04	1655	S	X		1	W	U	2				X	X	X										SO	N	1	44	368225
54SB61A	8-17-04	1745	S	X		1	W	U	2				X	X	X										SO	N	1	44	368226
54SB61B	8-17-04	1755	S	X		1	W	U	2				X	X	X										SO	N	1	44	368227
54SB61C	8-17-04	1815	S	X		1	W	U	2				X	X	X										SO	N	1	44	368228
54SB56A	8-18-04	1050	S	X		1	W	U	2				X	X	X										SO	N	1	44	368229
54SB56B	8-18-04	1120	S	X		1	W	U	2				X	X	X										SO	N	1	44	368230
54SB56C	8-18-04	1140	S	X		1	W	U	2				X	X	X										SO	N	1	44	368231
54SB59A	8-18-04	1150	S	X		1	W	U	2				X	X	X										SO	N	1	44	368232

ANALYSES

Box #1 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other _____

Box #2 Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8-18-04 1500			036440-18
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
[illegible]	8/19/04 9:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(1)

Radford Army Ammunition Plant
Chain of Custody Record

pg. 1 of 3

1240 → Cart
WR2

TMC576 19°C

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

00029

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)				REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B57A	8.17.04	1445	S	X		1	W	U	1								X											See COC#
~~545B57A~~	↓	↓	S	X		1	M	U	2				X	X	X													1264 For
DUP-1	8.17.04	—	S	X		1	W	U	1								X											lab sample
~~DUP-1~~	↓	—	S	X		1	M	U	2				X	X	X													ID
545B57B & MS MSD	8.17.04	1500	S	X		1	W	U	1								X											assignment
~~545B57B MS MSD~~	↓	↓	S	X		1	M	U	5				X	X	X													(WR2)
545B57C	8.17.04	1530	S	X		1	W	U	1								X											These
~~545B57C~~	↓	↓	S	X		1	M	U	2				X	X	X													samples
545B58A	8.17.04	1630	S	X		1	W	U	1								X											moved to
~~545B58A~~	↓	↓	S	X		1	M	U	2				X	X	X													another
545B58B	8.17.04	1640	S	X		1	W	U	1								X											cooler
~~545B58B~~	↓	↓	S	X		1	M	U	2				X	X	X													
545B58C	8.17.04	1655	S	X		1	W	U	1								X											
~~545B58C~~	↓	↓	S	X		1	M	U	2				X	X	X													

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8.18.04/1500			036440-18
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
[illegible]	8/19/04 9:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(1A)

Radford Army Ammunition Plant
Chain of Custody Record

pg. 2 of 3

1241 → WR2

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

00030

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B61A	8·17·04	1745	S	X		1	W	U	1								X								See Cust#
545B61A	↓	↓	S	X		1	M	U	2				X	X	X										1264 for
545B61B	8·17·04	1755	S	X		1	W	U	1								X								lab sample
545B61B	↓	↓	S	X		1	M	U	2				X	X	X										ID assignment
545B61C	8·17·04	1815	S	X		1	W	U	1								X								WR2
↓	↓	↓	S	X		1	M	U	2				X	X	X										
545B56A	8·18·04	1050	S	X		1	W	U	1								X								these
↓	↓	↓	S	X		1	M	U	2				X	X	X										samples
545B56B	8·18·04	1120	S	X		1	W	U	1								X								moved
↓	↓	↓	S	X		1	M	U	2				X	X	X										to another
545B56C	8·18·04	1140	S	X		1	W	U	1								X								cooler
↓	↓	↓	S	X		1	M	U	2				X	X	X										
545B59A	8·18·04	1150	S	X		1	W	U	1								X								
↓	↓	↓	S	X		1	M	U	2				X	X	X										

Box #1 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other _____

Box #2 Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8·18·04/1800			C36440-18
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
[illegible]	8/19/04 9:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(18)

Radford Army Ammunition Plant
Chain of Custody Record

pg 2 of 2

1265 (WR)

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000031

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	Matrix Code	SA Code	Test Group	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
545B59B	8-18-04	1350	5	X		1	M	U	2				X	X	X									SO	N1	44	368235
545B59C	8-18-04	1420	5	X		1	M	U	2				X	X	X									SO	N1	44	368234

Radford Army Ammunition Plant
Chain of Custody Record

pg. 3 of 3

CHAIN 3

1263 (WR)

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000032

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B59B	8-18-04	1350	S	X		1	W	U	1								X								
↓	↓	↓	S	X		1	M	U	2				X	X	X										moved to
545B59C	8-18-04	1420	S	X		1	W		1								X								another
↓	↓	↓	S	X		1	M	U	2				X	X	X										cooler
																									See COC #
																									1265 for
																									lab sample
																									ID assignment
																									WR
Dup-2	8-18-04	—	S	X		1	W	U	1								X								
↓	↓	—	S	X		1	M	U	2				X	X	X										moved to another

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day cooler
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8-18-04 1500			36440-18
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
John Parker	8/19/04 9:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

QA

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING NON-CONFORMANCE REPORT

Client LKP Bradford Army		Project-Submittal No. 36440-17 (4-1B)
Receipt Log No. 37-4	Completed By (initials/date) LKP 8/19/04	Project Chemist WSR

000037

List non-conformance issues associated with this submittal in the chart below/left. Identify discrepancies between the COC and sample tags in the chart below/right. Add comments as needed. Give to Project Chemist for immediate action.

COC ID No.	Line No.	Type of Problem: Discrepancy	Missing Container	Broken Container	Label Missing / Incomplete	Label Illegible	Low Volume	Inappropriate Container	Headspace	Not Listed on COC	Preservation
1263	1										
1262	1			✓							
1265	1										
1265										✓	

COC: Sample Field ID	Date Sampled	Time Sampled	Container Type	Qty	Sample Tag: Sample Field ID	Date Sampled	Time Sampled	Container Type	Qty	LIMS Qualifiers entered for this sample
545B59 B		13:50		1	545B59 B		14:00		1	
MS/MSD LKP 546W56		+								
545B59B		13:50		2	545B59B		14:00		2	

Comments:

1 of 12 amber broken upon arrival
546W56 MS/MSD

Assume sample TAG ID is correct but will confirm w/ Client.

Recieved 2 soil for Dup-2 not listed on COC — added to coc by TriMatrix
Client to be advised.

Project Chemist (initials/date): WSR 8/19/04

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army — Receipt Record Page/Line No.

Project Submittal No.: (new) / add to 36440-18

Project Chemist: CDR — Sample Nos.:

Coolers Received

Recorded by (initials/date): KNC/08-19-04

Qty Received: ☒ Cooler ☐ Box ☐ Other

Thermometer Used: ☐ IR Gun (#94) ☐ Digital Thermometer (#54) ☐ Other (#____)

☐ See Additional Cooler Information Form

Cooler No.	Time	Custody Seals	Coolant Location	Coolant / Temperature Taken Via	Alternate Temperature Taken Via
TMO 029	9:35	☐ none ☒ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☒ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container
TMO 576	9:35	☐ none ☒ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☒ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container
TMO 886	9:45	☐ none ☒ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☒ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container
TMO 264	9:50	☐ none ☒ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☒ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container

Cooler No.	Recorded °C	Correction Factor °C	Actual °C
TMO 029	tb	Not measured	
	tb location: representative / in ice		
	1 1.5	0	1.5
	2 2.4	0	2.4
	3 1.7	0	1.7
		Average °C	1.9
TMO 576	tb	Not measured	
	tb location: representative / in ice		
	1 3.6	0	3.6
	2 1.3	0	1.3
	3 0.8	0	0.8
		Average °C	1.9
TMO 886	tb	Not measured	
	tb location: representative / in ice		
	1 2.2	0	2.2
	2 1.2	0	1.2
	3 2.1	0	2.1
		Average °C	1.8
TMO 264	tb	not measured	
	tb location: representative / in ice		
	1 8.7	0	8.7
	2 1.9	0	1.9
	3 1.9	0	1.9
		Average °C	4.2

Cooler No.	Cooler ID on COC?	VOC trip blank received?
TMO 029	☒	☐
TMO 576	☒	☐
TMO 886	☒	☐
TMO 264	☒	☐

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☒	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by _____
	☒		Rec'd for Lab signed/date/time?
☐	☒		Shipping Document?
☐	☐		Other _____

COC ID Nos.: 1243, 1240, 1241, 1263, 1262, 1264, 1265, 1242, 1266,

☐ TriMatrix ☒ Other (name or ID#) Radford

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☒	☐	Sample ID matches COC?
☐	☒	Sample date and time matches COC?
☒	☐	Container type completed on COC?
☒	☒	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
	☒	☐	Broken containers/lids?
	☒	☐	Missing or incomplete labels?
	☒	☐	Illegible information on labels?
	☒	☐	Low volume received?
	☒	☐	Inappropriate containers received?
☒		☐	VOC vials have headspace?
☐	☒	☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☒	☐	All sample temperatures ≤4° C?
☐	☒		Completed Sample Preservation Verification Form?
☐	☒		Samples preserved correctly?
☒	☐		If "No", added orange tag?
☒	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes This version of checklist applies to COC #s: 1264, 1240, 1241, 1265, 1263.

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) _____
☐ No analysis requested, Proj. Chemist completed (init./date)

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/19/04 9:00	8/19/04 10:55	Yes (No)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST
ADDITIONAL COOLER INFORMATION

Recorded by (initials/date)	Client	Project-Submittal No.
KNC 10.8.19.04	Radford Army	36440-18
	Receipt Log No. 374 / Sample Nos.	Project Chemist WTR

Cooler No. TMO 994 — Time 10:00

Custody Seals
- ☐ none
- ☒ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☒ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	4.1	0	4.1
tb location: representative / in ice			
1	3.3	0	3.3
2	3.9	0	3.9
3	4.7	0	4.7
		Average °C	4.0

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. TMO 291 — Time 10:05

Custody Seals
- ☐ none
- ☒ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☒ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	1.9	0	1.9
tb location: representative / in ice			
1	2.2	0	2.2
2	3.5	0	3.5
3	3.7	0	3.7
		Average °C	3.1

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ — Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Comments

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-19

Fraction: Explosives, Nitroglycerin, Pesticides, Polychlorinated Biphenyls, & Metals

Lab: TriMatrix

Project Name: Radford SWMU 54

Reviewer: Andrea Sansom

Date: November 8, 2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: For the explosive analyses, the continuing calibration analyzed on 08/26/2004 at 1657 displayed a percent difference greater than the control limit (i.e., 15%) on column CN with a negative bias for tetryl at 15.3%. The continuing calibrations analyzed on column CN displayed percent differences greater than the control limit with a positive bias on 09/04/2004 at 1241 for 1,3-dinitrobenzene at 15.5% and at 1753 for 2,6-dinitrotoluene at 18.0%. All field sample extracts were non-detect for tetryl on the C18 column that displayed acceptable continuing calibrations. All field samples were non-detect for 1,3-dinitrobenzene and 2,6-dinitrotoluene on one of the two analytical columns despite the positive bias indicated on the CN column. Since only one column is required to pass to report valid non-detect results, no data qualifying action was taken.

For the pesticides analyses, the laboratory control spike for extraction batch 99444-123 displayed percent recoveries less than the laboratory lower control limits for 4,4'-DDD at 56%, alpha-chlordane at 56%, gamma-chlordane at 55%, and endrin ketone at 57%. Since these recoveries were greater than the QAPP lower control limit of 30%, no data qualifying action was taken. The matrix spike duplicate performed on field sample 54SB63B displayed percent recoveries greater than the laboratory generated upper control limits for beta-BHC at 140% and heptachlor epoxide at 135%. This matrix spike pair also displayed relative percent differences greater than the laboratory generated control limits for 4,4'-DDD at 40% and methoxychlor at 46%. Since these excursions were within QAPP specified recovery limits of 30-150% and the precision limit of less than 60%, no data qualifying action was taken. The continuing calibrations displayed the following percent differences greater than the control limit of 15%:

Date	Time	Instrument	Column	Analyte	Percent Difference	Bias
09/15/2004	2136	158	B	4,4'-DDD	21.4%	-
				alpha-BHC	15.9%	+
				beta-BHC	16.8%	+

Date	Time	Instrument	Column	Analyte	Percent Difference	Bias
09/16/2004	0332	158	A	4,4'-DDD	18.4%	-
				Methoxychlor	15.9%	-
			B	alpha-BHC	20.3%	+
				beta-BHC	16.0%	+
				gamma-BHC	15.4%	+
09/16/2004	0034	199	B	4,4'-DDD	25.6%	-
				4,4'-DDT	17.8%	-
				beta-BHC	27.3%	-
				delta-BHC	24.4%	-
				Methoxychlor	20.0%	-
	0636			4,4'-DDD	30.4%	-
				4,4'-DDE/Endosulfan I	16.5%	-
				4,4'-DDT	18.4%	-
				alpha-BHC	17.0%	-
				beta-BHC	21.9%	-
				delta-BHC	25.5%	-
				Methoxychlor	21.4%	-
	1238			4,4'-DDD	27.9%	-
				4,4'-DDE/Endosulfan I	18.0%	-
				4,4'-DDT	19.9%	-
				alpha-BHC	18.8%	-
				beta-BHC	20.8%	-
				delta-BHC	24.8%	-
				gamma-BHC	17.6%	-
				Methoxychlor	22.8%	-
09/25/2004	0041	158	A	4,4'-DDD	22.2%	-
				4,4'-DDT	16.7%	-
				beta-BHC	22.2%	-
				delta-BHC	26.5%	-
				Methoxychlor	21.0%	-
			B	4,4'-DDD	15.3%	-
				alpha-BHC	15.6%	-
				Endrin	16.0%	-
				Heptachlor	16.2%	-
				Methoxychlor	16.8%	-

For the anomalous compounds that displayed a positive bias, the associated field sample results were non-detect, thus, no data qualifying action was taken. For the anomalous compounds that displayed a negative bias, the associated field sample results were reported non-detect from the alternate passing column. Since only one column is required to pass to report a non-detect result, no data qualifying action was necessary. For anomalous compounds that displayed a negative bias on both analytical columns, the associated field sample results were non-detect and were flagged "UJ,c".

For the metals analyses, the instrument initial and/or continuing calibration blanks displayed negative estimate detections less than the reporting limit for barium, iron, manganese, potassium, and vanadium. The associated field sample results were positive and greater than five times the absolute value of the negative blank detections, thus, no data qualifying action was required. The initial and/or continuing calibration blanks displayed positive estimate detections less than the reporting limit for aluminum, magnesium, and

zinc. The associated field sample results were positive and greater than five times the blank detections, thus, no data qualifying action was required. The method blanks displayed the following detections:

Batch	Analyte	Concentration (mg/Kg)
98617-124	Selenium	0.049
98692-124	Aluminum	22.8
	Iron	3.93
	Magnesium	35.8
	Zinc	1.58

Positive associated field sample results less than five times the blank concentration for selenium were flagged "B,p". The other detections were attributed to instrument drift; therefore, no data qualifying action was taken. The equipment blank EQB-3 displayed positive estimate detections for chromium at 0.314 ug/L, iron at 9.478 ug/L, and zinc at 7.216 ug/L. The positive equipment blank result for chromium was previously qualified due to a method blank detection and no further data qualifying action was taken. Positive field sample results for iron and zinc were greater than five times the equipment blank detections and no data qualifying action was required. Although the matrix spike pair performed on sample 54SB63B displayed acceptable recoveries greater the laboratory generated lower control limit of 51% for selenium at 67% and 67%, the post digestion spike recovery was less than the lower control limit of 75% for selenium at 69%. The laboratory reported the concentration of selenium for this sample as calculated from the method of standard additions. The serial dilution performed on sample 54SB63B displayed a percent difference greater than the control limit of 10% for magnesium at 12.6%. The associated field sample results were positive and were flagged "J,s". By 6020, samples DUP 4 (122.6%), 54SB63A (120.9%), 54SB67B (130.9%), and 54SB67C (127.9%) exceeded the upper control limit of 120% for the internal standard used to quantitate arsenic, nickel, and selenium. Samples were analyzed at a dilution factor of two with passing internal standard recoveries. The elevated method detection limits multiplied by three were still less than the project required reporting limits.

Correctable Anomalies: The chain of custody and the sample container label had a different collection time for sample 54SB64B. As directed by the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.

Comments: All coolers were received by the laboratory with temperatures less than the lower control limit of 2.0°C at 0.0°C, 1.6°C, and 0.7°C. Since the containers were received intact and aliquots were not frozen, no impact to data quality was anticipated and no data qualifying action was taken. Due to the abundance of target element lead, all samples were analyzed at dilutions for this constituent only. The reporting limits for lead were elevated appropriately. If a given fraction was not discussed, no anomalies were encountered. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SWMU54
36440-19

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
368345	54SB60A	8/18/2004	Exp, Pest, PCBs, & Metals
368346	DUP-4	8/19/2004	Exp, Pest, PCBs, & Metals
368347	54SB60B	8/18/2004	Exp, Pest, PCBs, & Metals (+MS/MSD)
368348	54SB60C	8/18/2004	Exp, Pest, PCBs, & Metals
368349	54SB64A	8/18/2004	Exp, Pest, PCBs, & Metals
368350	54SB64B	8/18/2004	Exp, Pest, PCBs, & Metals
368351	54SB64C	8/18/2004	Exp, Pest, PCBs, & Metals
368352	54SB63A	8/19/2004	Exp, Pest, PCBs, & Metals
368353	54SB63B	8/19/2004	Exp, Pest, PCBs, & Metals
368354	54SB63C	8/19/2004	Exp, Pest, PCBs, & Metals
368355	54SB66A	8/19/2004	Exp, Pest, PCBs, & Metals
368356	54SB66B	8/19/2004	Exp, Pest, PCBs, & Metals
368357	54SB66C	8/19/2004	Exp, Pest, PCBs, & Metals
368358	54SB67A	8/19/2004	Exp, Pest, PCBs, & Metals
368359	54SB67B	8/19/2004	Exp, Pest, PCBs, & Metals
368360	54SB67C	8/19/2004	Exp, Pest, PCBs, & Metals
368361	54SB69A	8/19/2004	Exp, Pest, PCBs, & Metals
368362	54SB69B	8/19/2004	Exp, Pest, PCBs, & Metals
368363	54SB69C	8/19/2004	Exp, Pest, PCBs, & Metals
368364	54SB70A	8/19/2004	Exp, Pest, PCBs, & Metals

Radford Army Ammunitions Plant
SWMU54
Duplicate Statistics
54SB63A and DUP-2

	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	4xRL	Pass/ Fail
Explosives											
BDL											
Nitroglycerin											
BDL											
Pesticides											
BDL											
PCBs											
BDL											
Metals											
aluminum	mg/Kg	50	250	14500		16200		11%	1700	200	Pass
antimony	mg/Kg	0.5	3	0.094	J	0.13	J	32%	0.036	2.0	Pass
arsenic	mg/Kg	0.4	2	3.20		3.40		6.1%	0.20	1.6	Pass
barium	mg/Kg	5.0	25	237		275		15%	38	20	Pass
beryllium	mg/Kg	1.0	5	0.29	J	0.19	J	42%	0.1	4.0	Pass
cadmium	mg/Kg	1.0	5	2.7		3.3		20%	0.6	4.0	Pass
calcium	mg/Kg	250	1250	1370		1640		18%	270	1000	Pass
chromium	mg/Kg	5.0	25	20		24		18%	4.0	20	Pass
cobalt	mg/Kg	1.0	5	13		16		21%	3.0	4.0	Pass
copper	mg/Kg	5.0	25	18		22		20%	4.0	20.0	Pass
iron	mg/Kg	10	50	53600		61800		14%	8200	40	Pass
lead	mg/Kg	1.0	5	326		318		2.5%	8.0	4.0	Pass
magnesium	mg/Kg	250	1250	2360		2770		16%	410	1000	Pass
manganese	mg/Kg	5	25	2330		2670		14%	340	20	Pass
mercury	mg/Kg	0.1	0.5	0.056	J	0.056	J	0.0%	0	0.4	Pass
nickel	mg/Kg	0.5	3	13		14.0		7.4%	1.0	2.0	Pass
potassium	mg/Kg	100	500	1690		1640		3.0%	50	400	Pass
selenium	mg/Kg	1.0	5	0.31	J	0.32	J	3.2%	0.01	4.0	Pass
silver	mg/Kg	3.0	15	0.14	J	0.150	J	6.9%	0.01	12.0	Pass
sodium	mg/Kg	100	500	100	U	32	J	103%	68	400	Pass
thallium	mg/Kg	0.5	3	1.5		1.3		14%	0.20	2.0	Pass
vanadium	mg/Kg	1.2	6	34		41		19%	7.0	4.8	Pass
zinc	mg/Kg	4.0	20	1150		1310		13%	160.0	16	Pass

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 16:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB60A**	QC Batch:	98643 -124
Sample #:	**368345**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	85
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**DUP-4**	QC Batch:	98643 -124
Sample #:	**368346**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 17:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/26/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB60B**	QC Batch:	98643 -124
Sample #:	**368347**	Anal. Batch:	220739
Matrix:	Soil	Percent Solids:	75
Unit:	mg/kg dry	Dilution Factor:	1.3

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.267
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0673
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0667
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0946
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.128
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.115
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0919
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.150
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0694
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.151
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.225
98-95-3	Nitrobenzene	0.50 U	0.50	0.115
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.115
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0763

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 17:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB60C**	QC Batch:	98868 -127
Sample #:	**368348**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	80
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB64A**	QC Batch:	98868 -127
Sample #:	**368349**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	89
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB64B**	QC Batch:	98868 -127
Sample #:	**368350**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	81
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB64C**	QC Batch:	98868 -127
Sample #:	**368351**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB63A**	QC Batch:	98868 -127
Sample #:	**368352**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB63B**	QC Batch:	98868 -127
Sample #:	**368353**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB63C**	QC Batch:	98868 -127
Sample #:	**368354**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB66A**	QC Batch:	98868 -127
Sample #:	**368355**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	85
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB66B**	QC Batch:	98868 -127
Sample #:	**368356**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	81
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:45
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004 RFAAP SWMU 54	Analyzed:	09/03/04 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**54SB66C**	QC Batch:	98868 -127
Sample #:	**368357**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	73
Unit:	mg/kg dry	Dilution Factor:	1.4

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.287
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0725
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0718
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.102
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.138
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.124
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0990
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.161
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0748
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.162
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.242
98-95-3	Nitrobenzene	0.50 U	0.50	0.124
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.124
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0822

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 12:40
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004 RFAAP SWMU 54	Analyzed:	09/03/04 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**54SB67A**	QC Batch:	98868 -127
Sample #:	**368358**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	89
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 13:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB67B**	QC Batch:	98868 -127
Sample #:	**368359**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 13:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/03/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB67C**	QC Batch:	98868 -127
Sample #:	**368360**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	74
Unit:	mg/kg dry	Dilution Factor:	1.4

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.287
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0725
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0718
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.102
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.138
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.124
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0990
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.161
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0748
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.162
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.242
98-95-3	Nitrobenzene	0.50 U	0.50	0.124
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.124
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0822

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/04/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB69A**	QC Batch:	98868 -127
Sample #:	**368361**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	86
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/04/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB69B**	QC Batch:	98868 -127
Sample #:	**368362**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	82
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/04/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB69C**	QC Batch:	98868 -127
Sample #:	**368363**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	69
Unit:	mg/kg dry	Dilution Factor:	1.4

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.287
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0725
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0718
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.102
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.138
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.124
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0990
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.161
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0748
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.162
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.242
98-95-3	Nitrobenzene	0.50 U	0.50	0.124
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.124
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0822

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/04/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB70A**	QC Batch:	98868 -127
Sample #:	**368364**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	88
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 16:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB60A**	QC Batch:	98674 -124
Sample #:	**368345**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	85
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

001623

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**DUP-4**	QC Batch:	98674 -124
Sample #:	**368346**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 17:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/24/04 by DJM
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/27/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB60B**	QC Batch:	98674 -124
Sample #:	**368347**	Anal. Batch:	220854
Matrix:	Soil	Percent Solids:	75
Unit:	mg/kg dry	Dilution Factor:	1.3

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.57

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 17:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB60C**	QC Batch:	98864 -127
Sample #:	**368348**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	80
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB64A**	QC Batch:	98864 -127
Sample #:	**368349**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	89
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

001627

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB64B**	QC Batch:	98864 -127
Sample #:	**368350**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	81
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB64C**	QC Batch:	98864 -127
Sample #:	**368351**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB63A**	QC Batch:	98864 -127
Sample #:	**368352**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

001630

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:30
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004 RFAAP SWMU 54	Analyzed:	09/05/04 by JMK1
		Anal. Method:	USEPA-8332
Sample ID:	**54SB63B**	QC Batch:	98864 -127
Sample #:	**368353**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB63C**	QC Batch:	98864 -127
Sample #:	**368354**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

001632

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB66A**	QC Batch:	98864 -127
Sample #:	**368355**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	85
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB66B**	QC Batch:	98864 -127
Sample #:	**368356**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	81
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB66C**	QC Batch:	98864 -127
Sample #:	**368357**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	73
Unit:	mg/kg dry	Dilution Factor:	1.4

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.69

001635

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 12:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB67A**	QC Batch:	98864 -127
Sample #:	**368358**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	89
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 13:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB67B**	QC Batch:	98864 -127
Sample #:	**368359**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 13:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB67C**	QC Batch:	98864 -127
Sample #:	**368360**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	74
Unit:	mg/kg dry	Dilution Factor:	1.4

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.69

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB69A**	QC Batch:	98864 -127
Sample #:	**368361**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	86
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB69B**	QC Batch:	98864 -127
Sample #:	**368362**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	82
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB69C**	QC Batch:	98864 -127
Sample #:	**368363**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	69
Unit:	mg/kg dry	Dilution Factor:	1.4

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.69

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-19**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB70A**	QC Batch:	98864 -127
Sample #:	**368364**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	88
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 16:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB60A**	QC Batch:	99444 -123
Sample #:	**368345**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	5.9

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.77
72-55-9	4,4'-DDE	20 U	20	2.48
50-29-3	4,4'-DDT	20 U	20	2.57
309-00-2	Aldrin	20 U	20	1.90
319-84-6	Alpha-BHC	20 U	20	1.92
5103-71-9	A-Chlordane	20 U	20	2.10
5103-74-2	G-Chlordane	20 U	20	2.34
319-85-7	Beta-BHC	20 U	20	2.35
319-86-8	Delta-BHC	20 U	20	2.41
60-57-1	Dieldrin	20 U	20	2.42
959-98-8	Endosulfan I	20 U	20	1.16
33213-65-9	Endosulfan II	20 U	20	1.23
1031-07-8	Endosulfan Sulfate	20 U	20	2.54
72-20-8	Endrin	20 U	20	3.30
7421-93-4	Endrin Aldehyde	20 U	20	3.95
53494-70-5	Endrin Ketone	20 U	20	3.86
58-89-9	Lindane	20 U	20	1.83
76-44-8	Heptachlor	20 U	20	1.85
1024-57-3	Heptachlor Epoxide	20 U	20	2.12
72-43-5	Methoxychlor	20 U	20	2.93
8001-35-2	Toxaphene	320 U	320	66.7

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**DUP-4**	QC Batch:	99444 -123
Sample #:	**368346**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.82
72-55-9	4,4'-DDE	20 U	20	2.52
50-29-3	4,4'-DDT	20 U	20	2.61
309-00-2	Aldrin	20 U	20	1.93
319-84-6	Alpha-BHC	20 U	20	1.96
5103-71-9	A-Chlordane	20 U	20	2.14
5103-74-2	G-Chlordane	20 U	20	2.38
319-85-7	Beta-BHC	20 U	20	2.39
319-86-8	Delta-BHC	20 U	20	2.45
60-57-1	Dieldrin	20 U	20	2.46
959-98-8	Endosulfan I	20 U	20	1.18
33213-65-9	Endosulfan II	20 U	20	1.25
1031-07-8	Endosulfan Sulfate	20 U	20	2.59
72-20-8	Endrin	20 U	20	3.36
7421-93-4	Endrin Aldehyde	20 U	20	4.01
53494-70-5	Endrin Ketone	20 U	20	3.92
58-89-9	Lindane	20 U	20	1.87
76-44-8	Heptachlor	20 U	20	1.88
1024-57-3	Heptachlor Epoxide	20 U	20	2.15
72-43-5	Methoxychlor	20 U	20	2.98
8001-35-2	Toxaphene	320 U	320	67.8

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 17:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB60B**	QC Batch:	99444 -123
Sample #:	**368347**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	75
Unit:	ug/kg dry	Dilution Factor:	6.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	3.15
72-55-9	4,4'-DDE	20 U	20	2.81
50-29-3	4,4'-DDT	20 U	20	2.91
309-00-2	Aldrin	20 U	20	2.16
319-84-6	Alpha-BHC	20 U	20	2.18
5103-71-9	A-Chlordane	20 U	20	2.39
5103-74-2	G-Chlordane	20 U	20	2.66
319-85-7	Beta-BHC	20 U	20	2.67
319-86-8	Delta-BHC	20 U	20	2.74
60-57-1	Dieldrin	20 U	20	2.75
959-98-8	Endosulfan I	20 U	20	1.31
33213-65-9	Endosulfan II	20 U	20	1.40
1031-07-8	Endosulfan Sulfate	20 U	20	2.89
72-20-8	Endrin	20 U	20	3.75
7421-93-4	Endrin Aldehyde	20 U	20	4.48
53494-70-5	Endrin Ketone	20 U	20	4.38
58-89-9	Lindane	20 U	20	2.08
76-44-8	Heptachlor	20 U	20	2.10
1024-57-3	Heptachlor Epoxide	20 U	20	2.41
72-43-5	Methoxychlor	20 U	20	3.33
8001-35-2	Toxaphene	320 U	320	75.7

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 17:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB60C**	QC Batch:	99418 -125
Sample #:	**368348**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	6.2

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.91
72-55-9	4,4'-DDE	20 U	20	2.60
50-29-3	4,4'-DDT	20 U	20	2.70
309-00-2	Aldrin	20 U	20	2.00
319-84-6	Alpha-BHC	20 U	20	2.02
5103-71-9	A-Chlordane	20 U	20	2.21
5103-74-2	G-Chlordane	20 U	20	2.46
319-85-7	Beta-BHC	20 U	20	2.47
319-86-8	Delta-BHC	20 U	20	2.54
60-57-1	Dieldrin	20 U	20	2.54
959-98-8	Endosulfan I	20 U	20	1.22
33213-65-9	Endosulfan II	20 U	20	1.30
1031-07-8	Endosulfan Sulfate	20 U	20	2.67
72-20-8	Endrin	20 U	20	3.47
7421-93-4	Endrin Aldehyde	20 U	20	4.15
53494-70-5	Endrin Ketone	20 U	20	4.05
58-89-9	Lindane	20 U	20	1.93
76-44-8	Heptachlor	20 U	20	1.94
1024-57-3	Heptachlor Epoxide	20 U	20	2.23
72-43-5	Methoxychlor	20 U	20	3.08
8001-35-2	Toxaphene	320 U	320	70.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB64A**	QC Batch:	99418 -125
Sample #:	**368349**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	89
Unit:	ug/kg dry	Dilution Factor:	5.6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.63
72-55-9	4,4'-DDE	20 U	20	2.35
50-29-3	4,4'-DDT	20 U	20	2.44
309-00-2	Aldrin	20 U	20	1.80
319-84-6	Alpha-BHC	20 U	20	1.83
5103-71-9	A-Chlordane	20 U	20	1.99
5103-74-2	G-Chlordane	20 U	20	2.22
319-85-7	Beta-BHC	20 U	20	2.23
319-86-8	Delta-BHC	20 U	20	2.29
60-57-1	Dieldrin	20 U	20	2.30
959-98-8	Endosulfan I	20 U	20	1.10
33213-65-9	Endosulfan II	20 U	20	1.17
1031-07-8	Endosulfan Sulfate	20 U	20	2.41
72-20-8	Endrin	20 U	20	3.14
7421-93-4	Endrin Aldehyde	20 U	20	3.75
53494-70-5	Endrin Ketone	20 U	20	3.66
58-89-9	Lindane	20 U	20	1.74
76-44-8	Heptachlor	20 U	20	1.75
1024-57-3	Heptachlor Epoxide	20 U	20	2.01
72-43-5	Methoxychlor	20 U	20	2.78
8001-35-2	Toxaphene	320 U	320	63.3

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB64B**	QC Batch:	99418 -125
Sample #:	**368350**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	81
Unit:	ug/kg dry	Dilution Factor:	6.2

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.91
72-55-9	4,4'-DDE	20 U	20	2.60
50-29-3	4,4'-DDT	20 U	20	2.70
309-00-2	Aldrin	20 U	20	2.00
319-84-6	Alpha-BHC	20 U	20	2.02
5103-71-9	A-Chlordane	20 U	20	2.21
5103-74-2	G-Chlordane	20 U	20	2.46
319-85-7	Beta-BHC	20 U	20	2.47
319-86-8	Delta-BHC	20 U	20	2.54
60-57-1	Dieldrin	20 U	20	2.54
959-98-8	Endosulfan I	20 U	20	1.22
33213-65-9	Endosulfan II	20 U	20	1.30
1031-07-8	Endosulfan Sulfate	20 U	20	2.67
72-20-8	Endrin	20 U	20	3.47
7421-93-4	Endrin Aldehyde	20 U	20	4.15
53494-70-5	Endrin Ketone	20 U	20	4.05
58-89-9	Lindane	20 U	20	1.93
76-44-8	Heptachlor	20 U	20	1.94
1024-57-3	Heptachlor Epoxide	20 U	20	2.23
72-43-5	Methoxychlor	20 U	20	3.08
8001-35-2	Toxaphene	320 U	320	70.1

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Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB64C**	QC Batch:	99418 -125
Sample #:	**368351**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.82
72-55-9	4,4'-DDE	20 U	20	2.52
50-29-3	4,4'-DDT	20 U	20	2.61
309-00-2	Aldrin	20 U	20	1.93
319-84-6	Alpha-BHC	20 U	20	1.96
5103-71-9	A-Chlordane	20 U	20	2.14
5103-74-2	G-Chlordane	20 U	20	2.38
319-85-7	Beta-BHC	20 U	20	2.39
319-86-8	Delta-BHC	20 U	20	2.45
60-57-1	Dieldrin	20 U	20	2.46
959-98-8	Endosulfan I	20 U	20	1.18
33213-65-9	Endosulfan II	20 U	20	1.25
1031-07-8	Endosulfan Sulfate	20 U	20	2.59
72-20-8	Endrin	20 U	20	3.36
7421-93-4	Endrin Aldehyde	20 U	20	4.01
53494-70-5	Endrin Ketone	20 U	20	3.92
58-89-9	Lindane	20 U	20	1.87
76-44-8	Heptachlor	20 U	20	1.88
1024-57-3	Heptachlor Epoxide	20 U	20	2.15
72-43-5	Methoxychlor	20 U	20	2.98
8001-35-2	Toxaphene	320 U	320	67.8

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Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB63A**	QC Batch:	99418 -125
Sample #:	**368352**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.82
72-55-9	4,4'-DDE	20 U	20	2.52
50-29-3	4,4'-DDT	20 U	20	2.61
309-00-2	Aldrin	20 U	20	1.93
319-84-6	Alpha-BHC	20 U	20	1.96
5103-71-9	A-Chlordane	20 U	20	2.14
5103-74-2	G-Chlordane	20 U	20	2.38
319-85-7	Beta-BHC	20 U	20	2.39
319-86-8	Delta-BHC	20 U	20	2.45
60-57-1	Dieldrin	20 U	20	2.46
959-98-8	Endosulfan I	20 U	20	1.18
33213-65-9	Endosulfan II	20 U	20	1.25
1031-07-8	Endosulfan Sulfate	20 U	20	2.59
72-20-8	Endrin	20 U	20	3.36
7421-93-4	Endrin Aldehyde	20 U	20	4.01
53494-70-5	Endrin Ketone	20 U	20	3.92
58-89-9	Lindane	20 U	20	1.87
76-44-8	Heptachlor	20 U	20	1.88
1024-57-3	Heptachlor Epoxide	20 U	20	2.15
72-43-5	Methoxychlor	20 U	20	2.98
8001-35-2	Toxaphene	320 U	320	67.8

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB63B**	QC Batch:	99418 -125
Sample #:	**368353**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	*4,4'-DDD	20 U	20	2.82
72-55-9	4,4'-DDE	20 U	20	2.52
50-29-3	4,4'-DDT	20 U	20	2.61
309-00-2	Aldrin	20 U	20	1.93
319-84-6	Alpha-BHC	20 U	20	1.96
5103-71-9	A-Chlordane	20 U	20	2.14
5103-74-2	G-Chlordane	20 U	20	2.38
319-85-7	*Beta-BHC	20 U	20	2.39
319-86-8	Delta-BHC	20 U	20	2.45
60-57-1	Dieldrin	20 U	20	2.46
959-98-8	Endosulfan I	20 U	20	1.18
33213-65-9	Endosulfan II	20 U	20	1.25
1031-07-8	Endosulfan Sulfate	20 U	20	2.59
72-20-8	Endrin	20 U	20	3.36
7421-93-4	Endrin Aldehyde	20 U	20	4.01
53494-70-5	Endrin Ketone	20 U	20	3.92
58-89-9	Lindane	20 U	20	1.87
76-44-8	Heptachlor	20 U	20	1.88
1024-57-3	*Heptachlor Epoxide	20 U	20	2.15
72-43-5	*Methoxychlor	20 U	20	2.98
8001-35-2	Toxaphene	320 U	320	67.8

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB63C**	QC Batch:	99418 -125
Sample #:	**368354**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.82
72-55-9	4,4'-DDE	20 U	20	2.52
50-29-3	4,4'-DDT	20 U	20	2.61
309-00-2	Aldrin	20 U	20	1.93
319-84-6	Alpha-BHC	20 U	20	1.96
5103-71-9	A-Chlordane	20 U	20	2.14
5103-74-2	G-Chlordane	20 U	20	2.38
319-85-7	Beta-BHC	20 U	20	2.39
319-86-8	Delta-BHC	20 U	20	2.45
60-57-1	Dieldrin	20 U	20	2.46
959-98-8	Endosulfan I	20 U	20	1.18
33213-65-9	Endosulfan II	20 U	20	1.25
1031-07-8	Endosulfan Sulfate	20 U	20	2.59
72-20-8	Endrin	20 U	20	3.36
7421-93-4	Endrin Aldehyde	20 U	20	4.01
53494-70-5	Endrin Ketone	20 U	20	3.92
58-89-9	Lindane	20 U	20	1.87
76-44-8	Heptachlor	20 U	20	1.88
1024-57-3	Heptachlor Epoxide	20 U	20	2.15
72-43-5	Methoxychlor	20 U	20	2.98
8001-35-2	Toxaphene	320 U	320	67.8

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB66A**	QC Batch:	99418 -125
Sample #:	**368355**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	5.9

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.77
72-55-9	4,4'-DDE	20 U	20	2.48
50-29-3	4,4'-DDT	20 U	20	2.57
309-00-2	Aldrin	20 U	20	1.90
319-84-6	Alpha-BHC	20 U	20	1.92
5103-71-9	A-Chlordane	20 U	20	2.10
5103-74-2	G-Chlordane	20 U	20	2.34
319-85-7	Beta-BHC	20 U	20	2.35
319-86-8	Delta-BHC	20 U	20	2.41
60-57-1	Dieldrin	20 U	20	2.42
959-98-8	Endosulfan I	20 U	20	1.16
33213-65-9	Endosulfan II	20 U	20	1.23
1031-07-8	Endosulfan Sulfate	20 U	20	2.54
72-20-8	Endrin	20 U	20	3.30
7421-93-4	Endrin Aldehyde	20 U	20	3.95
53494-70-5	Endrin Ketone	20 U	20	3.86
58-89-9	Lindane	20 U	20	1.83
76-44-8	Heptachlor	20 U	20	1.85
1024-57-3	Heptachlor Epoxide	20 U	20	2.12
72-43-5	Methoxychlor	20 U	20	2.93
8001-35-2	Toxaphene	320 U	320	66.7

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB66B**	QC Batch:	99418 -125
Sample #:	**368356**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	81
Unit:	ug/kg dry	Dilution Factor:	6.2

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.91
72-55-9	4,4'-DDE	20 U	20	2.60
50-29-3	4,4'-DDT	20 U	20	2.70
309-00-2	Aldrin	20 U	20	2.00
319-84-6	Alpha-BHC	20 U	20	2.02
5103-71-9	A-Chlordane	20 U	20	2.21
5103-74-2	G-Chlordane	20 U	20	2.46
319-85-7	Beta-BHC	20 U	20	2.47
319-86-8	Delta-BHC	20 U	20	2.54
60-57-1	Dieldrin	20 U	20	2.54
959-98-8	Endosulfan I	20 U	20	1.22
33213-65-9	Endosulfan II	20 U	20	1.30
1031-07-8	Endosulfan Sulfate	20 U	20	2.67
72-20-8	Endrin	20 U	20	3.47
7421-93-4	Endrin Aldehyde	20 U	20	4.15
53494-70-5	Endrin Ketone	20 U	20	4.05
58-89-9	Lindane	20 U	20	1.93
76-44-8	Heptachlor	20 U	20	1.94
1024-57-3	Heptachlor Epoxide	20 U	20	2.23
72-43-5	Methoxychlor	20 U	20	3.08
8001-35-2	Toxaphene	320 U	320	70.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB66C**	QC Batch:	99418 -125
Sample #:	**368357**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	6.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	3.20
72-55-9	4,4'-DDE	20 U	20	2.86
50-29-3	4,4'-DDT	20 U	20	2.96
309-00-2	Aldrin	20 U	20	2.19
319-84-6	Alpha-BHC	20 U	20	2.22
5103-71-9	A-Chlordane	20 U	20	2.42
5103-74-2	G-Chlordane	20 U	20	2.70
319-85-7	Beta-BHC	20 U	20	2.71
319-86-8	Delta-BHC	20 U	20	2.78
60-57-1	Dieldrin	20 U	20	2.79
959-98-8	Endosulfan I	20 U	20	1.33
33213-65-9	Endosulfan II	20 U	20	1.42
1031-07-8	Endosulfan Sulfate	20 U	20	2.93
72-20-8	Endrin	20 U	20	3.81
7421-93-4	Endrin Aldehyde	20 U	20	4.55
53494-70-5	Endrin Ketone	20 U	20	4.45
58-89-9	Lindane	20 U	20	2.11
76-44-8	Heptachlor	20 U	20	2.13
1024-57-3	Heptachlor Epoxide	20 U	20	2.44
72-43-5	Methoxychlor	20 U	20	3.38
8001-35-2	Toxaphene	320 U	320	76.8

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 12:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB67A**	QC Batch:	99418 -125
Sample #:	**368358**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	89
Unit:	ug/kg dry	Dilution Factor:	5.6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.63
72-55-9	4,4'-DDE	20 U	20	2.35
50-29-3	4,4'-DDT	20 U	20	2.44
309-00-2	Aldrin	20 U	20	1.80
319-84-6	Alpha-BHC	20 U	20	1.83
5103-71-9	A-Chlordane	20 U	20	1.99
5103-74-2	G-Chlordane	20 U	20	2.22
319-85-7	Beta-BHC	20 U	20	2.23
319-86-8	Delta-BHC	20 U	20	2.29
60-57-1	Dieldrin	20 U	20	2.30
959-98-8	Endosulfan I	20 U	20	1.10
33213-65-9	Endosulfan II	20 U	20	1.17
1031-07-8	Endosulfan Sulfate	20 U	20	2.41
72-20-8	Endrin	20 U	20	3.14
7421-93-4	Endrin Aldehyde	20 U	20	3.75
53494-70-5	Endrin Ketone	20 U	20	3.66
58-89-9	Lindane	20 U	20	1.74
76-44-8	Heptachlor	20 U	20	1.75
1024-57-3	Heptachlor Epoxide	20 U	20	2.01
72-43-5	Methoxychlor	20 U	20	2.78
8001-35-2	Toxaphene	320 U	320	63.3

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 13:00
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004 RFAAP SWMU 54	Analyzed:	09/16/04 by MSN
		Anal. Method:	USEPA-8081A
Sample ID:	**54SB67B**	QC Batch:	99418 -125
Sample #:	**368359**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.68
72-55-9	4,4'-DDE	20 U	20	2.39
50-29-3	4,4'-DDT	20 U	20	2.48
309-00-2	Aldrin	20 U	20	1.84
319-84-6	Alpha-BHC	20 U	20	1.86
5103-71-9	A-Chlordane	20 U	20	2.03
5103-74-2	G-Chlordane	20 U	20	2.26
319-85-7	Beta-BHC	20 U	20	2.27
319-86-8	Delta-BHC	20 U	20	2.33
60-57-1	Dieldrin	20 U	20	2.34
959-98-8	Endosulfan I	20 U	20	1.12
33213-65-9	Endosulfan II	20 U	20	1.19
1031-07-8	Endosulfan Sulfate	20 U	20	2.46
72-20-8	Endrin	20 U	20	3.19
7421-93-4	Endrin Aldehyde	20 U	20	3.81
53494-70-5	Endrin Ketone	20 U	20	3.73
58-89-9	Lindane	20 U	20	1.77
76-44-8	Heptachlor	20 U	20	1.78
1024-57-3	Heptachlor Epoxide	20 U	20	2.05
72-43-5	Methoxychlor	20 U	20	2.83
8001-35-2	Toxaphene	320 U	320	64.4

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Client:	**URS Corporation**	Sampled:	08/19/04 @ 13:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB67C**	QC Batch:	99418 -125
Sample #:	**368360**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	6.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	3.20
72-55-9	4,4'-DDE	20 U	20	2.86
50-29-3	4,4'-DDT	20 U	20	2.96
309-00-2	Aldrin	20 U	20	2.19
319-84-6	Alpha-BHC	20 U	20	2.22
5103-71-9	A-Chlordane	20 U	20	2.42
5103-74-2	G-Chlordane	20 U	20	2.70
319-85-7	Beta-BHC	20 U	20	2.71
319-86-8	Delta-BHC	20 U	20	2.78
60-57-1	Dieldrin	20 U	20	2.79
959-98-8	Endosulfan I	20 U	20	1.33
33213-65-9	Endosulfan II	20 U	20	1.42
1031-07-8	Endosulfan Sulfate	20 U	20	2.93
72-20-8	Endrin	20 U	20	3.81
7421-93-4	Endrin Aldehyde	20 U	20	4.55
53494-70-5	Endrin Ketone	20 U	20	4.45
58-89-9	Lindane	20 U	20	2.11
76-44-8	Heptachlor	20 U	20	2.13
1024-57-3	Heptachlor Epoxide	20 U	20	2.44
72-43-5	Methoxychlor	20 U	20	3.38
8001-35-2	Toxaphene	320 U	320	76.8

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/24/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB69A**	QC Batch:	99418 -125
Sample #:	**368361**	Anal. Batch:	222062
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	~~1~~ 5.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL	
72-54-8	4,4'-DDD	20 U	UJ,C	20	~~0.478~~	2.78
72-55-9	4,4'-DDE	20 U		20	~~0.577~~	3.35
50-29-3	4,4'-DDT	20 U		20	~~0.538~~	3.13
309-00-2	Aldrin	20 U		20	~~0.450~~	2.62
319-84-6	Alpha-BHC	20 U		20	~~0.505~~	2.94
5103-71-9	A-Chlordane	20 U		20	~~0.449~~	2.61
5103-74-2	G-Chlordane	20 U		20	~~0.457~~	2.66
319-85-7	Beta-BHC	20 U		20	~~0.627~~	3.65
319-86-8	Delta-BHC	20 U		20	~~0.389~~	2.26
60-57-1	Dieldrin	20 U		20	~~0.471~~	2.74
959-98-8	Endosulfan I	20 U		20	~~0.524~~	3.05
33213-65-9	Endosulfan II	20 U		20	~~0.315~~	1.83
1031-07-8	Endosulfan Sulfate	20 U		20	~~0.537~~	3.12
72-20-8	Endrin	20 U		20	~~0.500~~	2.91
7421-93-4	Endrin Aldehyde	20 U		20	~~0.434~~	2.52
53494-70-5	Endrin Ketone	20 U		20	~~0.457~~	2.66
58-89-9	Lindane	20 U		20	~~0.524~~	3.05
76-44-8	Heptachlor	20 U		20	~~0.492~~	2.86
1024-57-3	Heptachlor Epoxide	20 U		20	~~0.692~~	4.02
72-43-5	Methoxychlor	20 U	UJ,C	20	~~0.933~~	5.42
8001-35-2	Toxaphene	320 U		320	~~13.7~~	79.7

VALUE CHANGES
11/22/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:10
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004 RFAAP SWMU 54	Analyzed:	09/16/04 by MSN
		Anal. Method:	USEPA-8081A
Sample ID:	**54SB69B**	QC Batch:	99418 -125
Sample #:	**368362**	Anal. Batch:	221765
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	6.1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.87
72-55-9	4,4'-DDE	20 U	20	2.56
50-29-3	4,4'-DDT	20 U	20	2.65
309-00-2	Aldrin	20 U	20	1.96
319-84-6	Alpha-BHC	20 U	20	1.99
5103-71-9	A-Chlordane	20 U	20	2.17
5103-74-2	G-Chlordane	20 U	20	2.42
319-85-7	Beta-BHC	20 U	20	2.43
319-86-8	Delta-BHC	20 U	20	2.49
60-57-1	Dieldrin	20 U	20	2.50
959-98-8	Endosulfan I	20 U	20	1.20
33213-65-9	Endosulfan II	20 U	20	1.27
1031-07-8	Endosulfan Sulfate	20 U	20	2.63
72-20-8	Endrin	20 U	20	3.42
7421-93-4	Endrin Aldehyde	20 U	20	4.08
53494-70-5	Endrin Ketone	20 U	20	3.99
58-89-9	Lindane	20 U	20	1.90
76-44-8	Heptachlor	20 U	20	1.91
1024-57-3	Heptachlor Epoxide	20 U	20	2.19
72-43-5	Methoxychlor	20 U	20	3.03
8001-35-2	Toxaphene	320 U	320	68.9

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB69C**	QC Batch:	99418 -125
Sample #:	**368363**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	69
Unit:	ug/kg dry	Dilution Factor:	7.2

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U UJ,c	20	3.44
72-55-9	4,4'-DDE	20 U	20	4.15
50-29-3	4,4'-DDT	20 U	20	3.87
309-00-2	Aldrin	20 U	20	3.24
319-84-6	Alpha-BHC	20 U	20	3.64
5103-71-9	A-Chlordane	20 U	20	3.23
5103-74-2	G-Chlordane	20 U	20	3.29
319-85-7	Beta-BHC	20 U	20	4.51
319-86-8	Delta-BHC	20 U	20	2.80
60-57-1	Dieldrin	20 U	20	3.39
959-98-8	Endosulfan I	20 U	20	3.77
33213-65-9	Endosulfan II	20 U	20	2.27
1031-07-8	Endosulfan Sulfate	20 U	20	3.87
72-20-8	Endrin	20 U	20	3.60
7421-93-4	Endrin Aldehyde	20 U	20	3.12
53494-70-5	Endrin Ketone	20 U	20	3.29
58-89-9	Lindane	20 U	20	3.77
76-44-8	Heptachlor	20 U	20	3.54
1024-57-3	Heptachlor Epoxide	20 U	20	4.98
72-43-5	Methoxychlor	20 U	20	6.72
8001-35-2	Toxaphene	320 U	320	98.6

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB70A**	QC Batch:	99418 -125
Sample #:	**368364**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	~~1~~ 5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL	
72-54-8	4,4'-DDD	20 U	UJ,c	20	~~0.478~~	2.72
72-55-9	4,4'-DDE	20 U		20	~~0.577~~	3.28
50-29-3	4,4'-DDT	20 U		20	~~0.538~~	3.06
309-00-2	Aldrin	20 U		20	~~0.450~~	2.56
319-84-6	Alpha-BHC	20 U		20	~~0.505~~	2.87
5103-71-9	A-Chlordane	20 U		20	~~0.449~~	2.55
5103-74-2	G-Chlordane	20 U		20	~~0.457~~	2.60
319-85-7	Beta-BHC	20 U		20	~~0.627~~	3.56
319-86-8	Delta-BHC	20 U		20	~~0.389~~	2.21
60-57-1	Dieldrin	20 U		20	~~0.471~~	2.68
959-98-8	Endosulfan I	20 U		20	~~0.524~~	2.98
33213-65-9	Endosulfan II	20 U		20	~~0.315~~	1.79
1031-07-8	Endosulfan Sulfate	20 U		20	~~0.537~~	3.05
72-20-8	Endrin	20 U		20	~~0.500~~	2.84
7421-93-4	Endrin Aldehyde	20 U		20	~~0.434~~	2.47
53494-70-5	Endrin Ketone	20 U		20	~~0.457~~	2.60
58-89-9	Lindane	20 U		20	~~0.524~~	2.98
76-44-8	Heptachlor	20 U		20	~~0.492~~	2.80
1024-57-3	Heptachlor Epoxide	20 U		20	~~0.692~~	3.93
72-43-5	Methoxychlor	20 U		20	~~0.933~~	5.30
8001-35-2	Toxaphene	320 U		320	~~13.7~~	77.8

VALUE CHANGES
11/22/04

001800

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 16:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB60A**	QC Batch:	98725 -123
Sample #:	**368345**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	**PCB-1254**	**18 J**	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**DUP-4**	QC Batch:	98725 -123
Sample #:	**368346**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 17:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/23/04 by JEO
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB60B**	QC Batch:	98725 -123
Sample #:	**368347**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	75
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	10.5
11104-28-2	PCB-1221	66 U	66	12.2
11141-16-5	PCB-1232	66 U	66	10.8
53469-21-9	PCB-1242	33 U	33	7.28
12672-29-6	PCB-1248	33 U	33	6.89
11097-69-1	PCB-1254	33 U	33	8.84
11096-82-5	PCB-1260	66 U	66	13.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 17:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB60C**	QC Batch:	98837 -125
Sample #:	**368348**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	10.5
11104-28-2	PCB-1221	66 U	66	12.2
11141-16-5	PCB-1232	66 U	66	10.8
53469-21-9	PCB-1242	33 U	33	7.28
12672-29-6	PCB-1248	33 U	33	6.89
11097-69-1	PCB-1254	33 U	33	8.84
11096-82-5	PCB-1260	66 U	66	13.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB64A**	QC Batch:	98837 -125
Sample #:	**368349**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	89
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	**PCB-1254**	**12 J**	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB64B**	QC Batch:	98837 -125
Sample #:	**368350**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	81
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB64C**	QC Batch:	98837 -125
Sample #:	**368351**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB63A**	QC Batch:	98837 -125
Sample #:	**368352**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB63B**	QC Batch:	98837 -125
Sample #:	**368353**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB63C**	QC Batch:	98837 -125
Sample #:	**368354**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB66A**	QC Batch:	98837 -125
Sample #:	**368355**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	08/31/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB66B**	QC Batch:	98837 -125
Sample #:	**368356**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	81
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB66C**	QC Batch:	98837 -125
Sample #:	**368357**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	11.3
11104-28-2	PCB-1221	66 U	66	13.2
11141-16-5	PCB-1232	66 U	66	11.6
53469-21-9	PCB-1242	33 U	33	7.84
12672-29-6	PCB-1248	33 U	33	7.42
11097-69-1	PCB-1254	33 U	33	9.52
11096-82-5	PCB-1260	66 U	66	14.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 12:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB67A**	QC Batch:	98837 -125
Sample #:	**368358**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	89
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	**PCB-1254**	**13 J**	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 13:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB67B**	QC Batch:	98837 -125
Sample #:	**368359**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 13:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB67C**	QC Batch:	98837 -125
Sample #:	**368360**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	11.3
11104-28-2	PCB-1221	66 U	66	13.2
11141-16-5	PCB-1232	66 U	66	11.6
53469-21-9	PCB-1242	33 U	33	7.84
12672-29-6	PCB-1248	33 U	33	7.42
11097-69-1	PCB-1254	33 U	33	9.52
11096-82-5	PCB-1260	66 U	66	14.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB69A**	QC Batch:	98837 -125
Sample #:	**368361**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	**PCB-1254**	**15 J**	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB69B**	QC Batch:	98837 -125
Sample #:	**368362**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB69C**	QC Batch:	98837 -125
Sample #:	**368363**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	69
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	11.3
11104-28-2	PCB-1221	66 U	66	13.2
11141-16-5	PCB-1232	66 U	66	11.6
53469-21-9	PCB-1242	33 U	33	7.84
12672-29-6	PCB-1248	33 U	33	7.42
11097-69-1	PCB-1254	33 U	33	9.52
11096-82-5	PCB-1260	66 U	66	14.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-19**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 18-19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB70A**	QC Batch:	98837 -125
Sample #:	**368364**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

End of Analytical Report

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 16:45
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB60A**
Sample #: **368345**
Matrix: Soil

Percent Solids: 85

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	11600	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.63	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	2.3	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	147	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.083 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.9	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	4240	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	21	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	12	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	19	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	37700	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	175	25 DF25	1.94	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3600 J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	1300	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.060 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	11	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1460	100	7.79	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Selenium, Total	0.21 J B,P	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.17 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.48 J	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	30	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	575	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 00:00
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **DUP-4**
Sample #: **368346**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	16200	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.13 J	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	3.4	0.40	0.116	mg/kg dry	09/10/04	DSC	USEPA-6020
Barium, Total	275	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.19 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	3.3	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1640	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	24	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	16	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	22	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	61800	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	318	50 DF50	3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2770 J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	2670	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.056 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	14	0.50	0.155	mg/kg dry	09/10/04	DSC	USEPA-6020
Potassium, Total	1640	100	7.79	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Selenium, Total	0.32 J	1.0	0.0972	mg/kg dry	09/10/04	DSC	USEPA-6020
Silver, Total	0.15 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	32 J	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	1.3	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	41	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	1310	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 17:00
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB60B**
Sample #: **368347**
Matrix: Soil

Percent Solids: 75

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	22400		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	1.7		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	247		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.63 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	3.8		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	2140		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	29		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	16		1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	23		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	44500		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	373		50	DF50 3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	4400	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	1680		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.055 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	15		0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	2290		100	7.79	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Selenium, Total	0.052 J	B,P	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.15 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	40 J		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.97		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	53		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	1390		4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 17:20
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB60C**
Sample #: **368348**
Matrix: Soil

Percent Solids: 80

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	15700		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	1.9		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	184		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.23 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.5		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1870		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	23		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	13		1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	18		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	38300		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	296		50 DF50	3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3130	J/S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	1350		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.037 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	12		0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1460		100	7.79	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Selenium, Total	0.13 J	B/P	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.12 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.93		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	39		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	934		4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 18:00
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB64A**
Sample #: **368349**
Matrix: Soil

Percent Solids: 89

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	13500		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.062 J		0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	2.1		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	157		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.13 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.3		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	2070		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	22		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	13		1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	21		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	39500		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	179		25	DF25 1.94	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2840	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	1280		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.056 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	12		0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1480		100	7.79	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Selenium, Total	0.21 J	B,P	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.12 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.46 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	33		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	599		4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 18:30
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB64B**
Sample #: **368350**
Matrix: Soil

Percent Solids: 81

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	23400	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	1.5	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	234	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.56 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	3.1	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	2120	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	30	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	15	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	22	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	36200	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	355	50 DF50	3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	4340 J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	1350	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.040 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	15	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	2800	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.14 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	45 J	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.58	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	53	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	949	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 18:45
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB64C**
Sample #: **368351**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	10300	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	1.3	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	113	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.19 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.9	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1810	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	20	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	8.6	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	13	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	27100	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	177	25 DF25	1.94	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2430 J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	827	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.030 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	9.2	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1420	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.14 J B,P	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.087 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.36 J	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	27	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	507	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 10:10
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB63A**
Sample #: **368352**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	14500	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.094 J	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	3.2	0.40	0.116	mg/kg dry	09/10/04	DSC	USEPA-6020
Barium, Total	237	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.29 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.7	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1370	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	20	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	13	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	18	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	53600	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	326	50	DF50 3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2360 J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	2330	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.056 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	13	0.50	0.155	mg/kg dry	09/10/04	DSC	USEPA-6020
Potassium, Total	1690	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.31 J	1.0	0.0972	mg/kg dry	09/10/04	DSC	USEPA-6020
Silver, Total	0.14 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	1.5	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	34	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	1150	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 10:30
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB63B**
Sample #: **368353**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	9300		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	0.66		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	107		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.30 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.5		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1760		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	18		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	7.2		1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	7.4		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	15300		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	72		10 DF10	0.776	mg/kg dry	08/27/04	DWJ	USEPA-6020
* Magnesium, Total	2380	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	403		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.016 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	10		0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1150		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
* Selenium, Total	0.23 J	B,P	1.0	0.0486	mg/kg dry	09/10/04	DSC	USEPA-6020
Silver, Total	0.049 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	39 J		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.17 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	22		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	128		4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 10:45
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB63C**
Sample #: **368354**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	10500		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	0.80		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	113		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.27 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.7		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1700		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	21		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	8.1		1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	10		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	18500		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	117		25	DF25 1.94	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2590	J/S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	527		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.017 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	10		0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1280		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.066 J	B/P	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.060 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	36 J		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.19 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	26		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	262		4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 11:10
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB66A**
Sample #: **368355**
Matrix: Soil

Percent Solids: 85

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	16100		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.071 J		0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	2.8		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	247		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.20 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.9		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1730		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	23		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	16		1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	22		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	52400		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	297		50 DF50	3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2720	J/S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	2150		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.062 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	12		0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1760		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.18 J	B/P	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.15 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	1.0		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	39		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	921		4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 11:25
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB66B**
Sample #: **368356**
Matrix: Soil

Percent Solids: 81

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	18500	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	1.3	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	169	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.46 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.4	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1660	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	26	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	12	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	22	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	28300	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	304	50	DF50 3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3400 J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	911	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.032 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	14	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1940	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.12 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.41 J	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	42	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	575	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 11:45
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB66C**
Sample #: **368357**
Matrix: Soil

Percent Solids: 73

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	18100		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.27 J		0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	1.2		0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	171		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.54 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.0		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1930		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	28		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	12		1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	17		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	27000		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	241		50	DF50 3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3450	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	900		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.028 J		0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	14		0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1760		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.049 J	B,P	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.10 J		3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	37 J		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.27 J		0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	43		1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	321		4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 12:40
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB67A**
Sample #: **368358**
Matrix: Soil

Percent Solids: 89

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	13100	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.13 J	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	2.0	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	146	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.18 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.0	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	3850	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	23	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	13	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	19	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	36300	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	152	25	1.94	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3800	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	1170	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.059 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	12	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1850	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.20 J	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.12 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.47 J	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	32	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	530	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 13:00
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB67B**
Sample #: **368359**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	12000	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.14 J	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	4.7	0.40	0.116	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	261	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.073 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	3.4	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1430	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	20	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	16	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	19	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	77900	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	502	100 DF100	7.76	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2060 J/S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	3250	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.065 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	15	0.50	0.155	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1210	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.30 J	1.0	0.0972	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.19 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	2.8	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	35	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	1870	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 13:15
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB67C**
Sample #: **368360**
Matrix: Soil

Percent Solids: 74

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	18400	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.16 J	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	4.0	0.40	0.116	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	293	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.28 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	4.5	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1650	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	25	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	19	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	27	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	94100	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	568	100 DF100	7.76	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	2940 J/S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	3710	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.085 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	17	0.50	0.155	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1830	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.38 J	1.0	0.0972	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.27 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	38 J	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	4.1	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	49	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	2750	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 14:00
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB69A**
Sample #: **368361**
Matrix: Soil

Percent Solids: 86

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	14900	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.12 J	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	2.5	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	191	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.27 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.7	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	2350	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	22	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	20	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	22	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	47900	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	210	25 DF25	1.94	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3030 J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	1860	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.062 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	12	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1540	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.16 J B,P	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.14 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	42 J	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.77	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	36	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	711	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 14:10
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB69B**
Sample #: **368362**
Matrix: Soil

Percent Solids: 82

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	15800	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	1.4	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	159	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.47 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.4	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1750	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	24	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	12	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	18	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	26100	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	247	50 DF50	3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3610 J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	864	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.030 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	13	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1970	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.11 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.35 J	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	38	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	748	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 14:25
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB69C**
Sample #: **368363**
Matrix: Soil

Percent Solids: 69

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	16700	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	1.2	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	163	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.52 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.6	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1730	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	27	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	13	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	20	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	27700	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	252	50	DF50 3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3580 J/S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	936	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.032 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	14	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1990	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.11 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.35 J	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	41	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	719	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 15:00
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB70A**
Sample #: **368364**
Matrix: Soil

Percent Solids: 88

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	17100	50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U	0.50	0.0386	mg/kg dry	09/13/04	DWJ	USEPA-6020
Arsenic, Total	1.3	0.40	0.0580	mg/kg dry	08/27/04	DWJ	USEPA-6020
Barium, Total	159	5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.50 J	1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.3	1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1970	250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	26	5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	12	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	18	5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	25200	10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	255	50	DF50 3.88	mg/kg dry	08/27/04	DWJ	USEPA-6020
Magnesium, Total	3330 J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	334	5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.031 J	0.10	0.0077	mg/kg dry	08/25/04	DSC	USEPA-7471A
Nickel, Total	14	0.50	0.0775	mg/kg dry	08/27/04	DWJ	USEPA-6020
Potassium, Total	1830	100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.071 J B,P	1.0	0.0486	mg/kg dry	08/27/04	DWJ	USEPA-6020
Silver, Total	0.10 J	3.0	0.0178	mg/kg dry	08/27/04	DWJ	USEPA-6020
Sodium, Total	100 U	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.28 J	0.50	0.0733	mg/kg dry	08/27/04	DWJ	USEPA-6020
Vanadium, Total	41	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	436	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 16:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB60A**		
Sample #:	**368345**		
Matrix:	Soil	Percent Solids:	85

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	85	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003388

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**DUP-4**		
Sample #:	**368346**		
Matrix:	Soil	Percent Solids:	84

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	84	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003389

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 17:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB60B**		
Sample #:	**368347**		
Matrix:	Soil	Percent Solids:	75

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	75	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003390

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 17:20
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004 RFAAP SWMU 54		
Sample ID:	**54SB60C**		
Sample #:	**368348**		
Matrix:	Soil	Percent Solids:	80

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	80	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003391

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB64A**		
Sample #:	**368349**		
Matrix:	Soil	Percent Solids:	89

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	89	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/18/04 @ 18:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB64B**		
Sample #:	**368350**		
Matrix:	Soil	Percent Solids:	81

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	81	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003393

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/18/04 @ 18:45
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB64C**
Sample #: **368351**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	84	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003394

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB63A**		
Sample #:	**368352**		
Matrix:	Soil	Percent Solids:	83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	83	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003395

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB63B**		
Sample #:	**368353**		
Matrix:	Soil	Percent Solids:	84

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	84	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003396

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 10:45
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004 RFAAP SWMU 54		
Sample ID:	**54SB63C**		
Sample #:	**368354**		
Matrix:	Soil	Percent Solids:	83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	83	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003397

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 11:10
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB66A**
Sample #: **368355**
Matrix: Soil

Percent Solids: 85

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	85	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003398

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 11:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB66B**		
Sample #:	**368356**		
Matrix:	Soil	Percent Solids:	81

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	81	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003399

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 11:45
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB66C**
Sample #: **368357**
Matrix: Soil

Percent Solids: 73

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	73	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003400

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 12:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB67A**		
Sample #:	**368358**		
Matrix:	Soil	Percent Solids:	89

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	89	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003401

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 13:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB67B**		
Sample #:	**368359**		
Matrix:	Soil	Percent Solids:	87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	87	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003402

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 13:15
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB67C**
Sample #: **368360**
Matrix: Soil

Percent Solids: 74

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	74	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003403

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 14:00
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB69A**
Sample #: **368361**
Matrix: Soil

Percent Solids: 86

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	86	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003404

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 14:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/19/04 @ 08:40
Submittal #:	**36440-19**		
Submittal:	Soil, Aug 18-19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB69B**		
Sample #:	**368362**		
Matrix:	Soil	Percent Solids:	82

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	82	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003405

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 14:25
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB69C**
Sample #: **368363**
Matrix: Soil

Percent Solids: 69

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	69	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003406

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 15:00
Sampler: D. Copen
Received: 08/19/04 @ 08:40

Submittal #: **36440-19**
Submittal: Soil, Aug 18-19, 2004
RFAAP SWMU 54
Sample ID: **54SB70A**
Sample #: **368364**
Matrix: Soil

Percent Solids: 88

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	88	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

003407

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DATA VALIDATION WORKSHEET

Explosives

Reviewer: Andrea Sansom
Date: 11/11/2004
DV Level: II III IV

Review Document:

_X_ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
_X_ Project QAPP/SAP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-19
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	X		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids (for		X	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: *The chain of custody and the sample container label had a different collection time for sample 54SB64B. As directed from the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.*

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: *Three coolers at 0C, 1.6C and 0.7C.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	X		

Notes: *EQB-1, EQB-2, and EQB-3 are non-detect*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		X	
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?		X	
6.4	Are there any RPD for MS/MSD recoveries outside the QC limits not to exceed 60%?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 54SB63B MS MSD RPD

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			X
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54SB63A and DUP-4*

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	X		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.			X
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		X		
	Number of samples:	20			
	Number of target compounds in each analysis:	14			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: Andrea Sansom
Date: 11/11/2004
DV Level: **II** **III** **IV**
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-19
Test Name: Nitroglycerin
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		**Yes**	**No**	**NA**
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids (for		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes: *The chain of custody and the sample container label had a different collection time for sample 54SB64B. As directed from the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.*

2.0 Holding Times		**Yes**	**No**	**NA**
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	X		
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: *Three coolers at 0C, 1.6C and 0.7C.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	X		

Notes: *EQB-1, EQB-2, and EQB-3 are non-detect*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: *54SB63B*

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54SB63A and DUP-4*

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 20			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: Andrea Sansom
Date: November 11, 2004
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-19
Test Name: PEST/PCB
Method No.: 8081A/8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Do any soil samples contain more than 50% water?	X		
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes: *The chain of custody and the sample container label had a different collection time for sample 54SB64B. As directed from the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.*

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		X	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		X	

Notes: *Three coolers at 0C, 1.6C and 0.7C .*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	X		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	X		

Notes: *EQB-1, EQB-2, EQB-3, & EQB-4 are non-detect*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	X		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	X		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		Pest	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows? If No, the associated sample result should be carefully evaluated.	X		

Notes:

5.0 GC/ECD Instrument Performance Check for Pesticides		Yes	No	NA
5.1	Is the 4,4'-DDT breakdown </= to 15%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	X		
5.2	Is the endrin breakdown </= to 15%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	X		

Notes:

6.0 Surrogate Recovery					Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?				X		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.				X		
6.3	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?				X		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?						X
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)						X
	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance			
	1 out	high/low	No action	No action			
	2 out	2 high same column	K	No action			
		2 low same column	L, UL	No action			
		mixed same column	J, UJ	No action			
		2 high diff columns	J	Not applicable			
		2 low diff columns	J, UJ	Not applicable			
		mixed diff columns	Professional judgement	Not applicable			
	3 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		2 high, 1 low	K (2 high)	J (1 low 2nd column)			
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)			
		other mixed	J, UJ	Not applicable			
	4 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		Mixed	J, UJ	Not applicable			
	If any recovery is >0% and <10% then L(+)/R(-).						
	If any recovery is 0% then R(+/-).						

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 30-150%?		X	
7.4	Are there any RPDs outside the QC limits not to exceed 60%?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 54SB63B MS MSD RPD

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	X		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 30-150%?		X	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			X
	If Yes, J(+) only.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54SB63A and DUP-4*

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).			X
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	X		

Notes:

11.0 Pesticide Cleanup Checks		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes: *CLP requirement, not provided*

Case narrative indicates mercury was used to remove sulfur due to the possibility of degradation of some pesticide target analytes with use of the recommended cleanup with activated copper.

12.0 Data Completeness				Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	Pest	PCB	X		
	Number of samples:	20	20			
	Number of target compounds in each analysis:	21	7			
	Number of results rejected and not reported:	0	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)					
	% Completeness =	100%	100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP/ICPMS/CVAA
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-19
Project No.: 21355035.20001

Project Name: Radford SWMU54
Reviewer: Andrea Sansom
Date: 11/11/2004

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	x			x			x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x			x			x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x			x			x		
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)		x			x			x	
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	x			x			x		

Note: *The chain of custody and the sample container label had a different collection time for sample 54SB64B. As directed from the field sampler, the laboratory used the collection time from the sample container label for log-in purposes.*

*Three coolers at **0C, 1.6C** and **0.7C**.*

2.0 Holding Time		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		x			x			x	

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".	7+BLK			4+BLK			5+BLK		
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).	x			x			x		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	x			x			x		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based	x			x			x		
3.5	Were ICV/CCV reported from mutiple exposures (3 for ICP or 2 for CVAA) with passing %RSD (ICP < 5% or CVAA < 10%)? If no, contact project chemist for laboratory resolution.	x			x			x		
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP: 90%-110% & Hg: 80-120%	x			x			x		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%									
3.7	For one point curves on ICP & ICPMS, did the CRDL standard recover between 80-120%? <50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K			x			x	105%		

Note: *TriMatrix incorporated a higher calibration standard to limit the number of required analytical dilutions for Al, Ba, Ca, Fe, Mn, and K.*

TriMatrix felt this would affect the low end of the curve creating more error at the non-detect detection limit of an acceptable CCB or MB.

TriMatrix elevated these reporting limits by a factor of five for this reason, while still meeting the project DQOs.

URS requested a new MDL study or processing through the new curve and/or to elevate the MDL as well.

Evaluation of the CCBs and MB was performed down to the MDL for both positive and negative detections.

4.0 Blanks

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	x			x			x		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	x			x			x		
4.3	Are there reported MB or ICB/CCBs values > MDL?	x			x				x	
	Sample Results > MDL									
	< 5X Blank Contamination B									
4.4	Are there negative blank results with the absolute value > MDL?		x		x				x	
	Sample Results Non-detects > MDL									
	< 5X absolute Blank Contamination UL L									
4.5	Are there reported field blank > ± MDL?	x			x				x	
	Sample Results > MDL									
	< 5X Blank Contamination B									

Note:

EQB-2 Non-detect

EQB-3 Cr 0.3 J B,p

Fe 9.5 J

Zn 7.2 J L,o

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	x			x					
5.2	Are the ICS AB recoveries within 80% - 120%?	x			x					
5.3	Are the results for unspiked analytes (in ICS A) <± MDL?		x			x				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?		x			x				
	If not...									
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)									

Note:

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	X			X			X		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		X			X			X	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)									

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	X			X			X		
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.									
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	X			X			X		

Note: *54SB63B*

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	x			x			x		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?									
	%R > 125% 30%< %R < 74% < 30%									
	Positive K L L	x			x			x		
	Non-detect None UL R									
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	Se			x					x

Note: *54SB63B - MS/MSD/RPD - passed ; PDS displayed Se @ 69% (statement of qualifications) or 71% (anomaly report)*

selenium for this sample was reported using method of standard additions.

9.0 Instrument Detection Limits (IDL)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	x			x			x		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	x			x					
10.2	Was a five-fold dilution performed?	x			x					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).	x				x				

Note: *54SB63B -Mg by 6010B @ 12.6%*

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	x			x			x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.									
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report	x			x			x		

Note: *54SB63A and DUP-4*

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	x			x			x		
12.2	Were all dilutions reflected in the positive results and detection limits?	x					x			x
12.3	Were the Internal Standard recoveries within 30-120% (6020) or 80-120% (6010B)?	DF2			x					
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	x								
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	x								
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	x								

Note: *By 6020, samples DUP 4 (122%), 54SB63A (121%), 54SB67B (127%), and 54SB67C (129%) exceeded the upper control limit of the internal standard used to quantitate As, Ni, & Se. Samples were analyzed at dilution factor of two with passing internal standard recoveries. The elevated MDLs multiplied by three were still less than RL*

13.0 Completeness Calculation		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	x			x			x		
13.1.1	Number of samples: 20									
13.1.2	Number of target compounds in each analysis: 23									
13.1.3	Number of results rejected and not reported: 0									
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%									

Note:

Radford Army Ammunition Plant
Chain of Custody Record

#2 1 of 2 — 1270 → (WR) — Big Cart — TM0998

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No: 000029

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)			REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B60A	8.18.04	1645	5	X		1	W	U	1								X										See COC 1268
DUP-4	8.19.04	—	5	X		1	W	U	1								X										For lab sample
545B60B	8.18.04	1700	5	X		1	W	U	1								X										ID assignment
545B60C	8.18.04	1720	5	X		1	W	U	1								X										
545B64A	8.18.04	1800	5	X		1	W	U	1								X										
545B64B	8.18.04	1820	5	X		1	W	U	1								X										
545B64C	8.18.04	1845	5	X		1	W	U	1								X										
545B63A	8.19.04	1010	5	X		1	W	U	1								X										
545B63B & MS MSD	8.19.04	1030	5	X		1	W	U	1								X										
545B63C	8.19.04	1045	5	X		1	W	U	1								X										
545B66A	8.19.04	1110	5	X		1	W	U	1								X										
545B66B	8.19.04	1125	5	X		1	W	U	1								X										
545B66C	8.19.04	1145	5	X		1	W	U	1								X										
545B67A	8.19.04	1240	5	X		1	W	U	1								X										

Box #1 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other _____

Box #2 Y. Yellow / HCl; W. White / None; E. En Core / None; S. Salmon / None; M. Manila / None; O. Other; G. Green / None; DB. Dark Blue / H_2SO_4; LB. Lt. Blue / NaOH; LY. Light Yellow / None; R. Red / HNO_3; RW. Red & White Stripes / HNO_3

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8.19.04 1610			36440-19
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Lori Parker	8/20/04 8:40			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

39-6

(1A)

Radford Army Ammunition Plant
Chain of Custody Record

pg 1 of 2

1268 → WR2

Big Cum

TM0929

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000028

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SAMPLE CODE	MATRIX CODE	TEST GROUP	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
54SB60A	8·18·04	1645	S	X		1	m	u	2				X	X	X										SO	N 1	44	368345
DUP-4	8·19·04	—	S	X		1	m	u	2				X	X	X										SO	FD 1	44	368346
54SB60B	8·18·04	1700	S	X		1	m	u	2				X	X	X										SO	N 1	44	368347
54SB60C	8·18·04	1720	S	X		1	m	u	2				X	X	X										SO	N 1	44	368348
54SB64A	8·18·04	1800	S	X		1	m	u	2				X	X	X										SO	N 1	44	368349
54SB64B	8·18·04	1820	S	X		1	m	u	2				X	X	X										SO	N 1	44	368350
54SB64C	8·18·04	1845	S	X		1	m	u	2				X	X	X										SO	N 1	44	368351
54SB63A	8·19·04	1010	S	X		1	m	u	2				X	X	X										SO	N 1	44	368352
54SB63B MS/MSD	8·19·04	1030	S	X		1	m	u	5				X	X	X										SO	N 1	44	368353
54SB63C	8·19·04	1045	S	X		1	m	u	2				X	X	X										SO	N 1	44	368354
54SB66A	8·19·04	1110	S	X		1	m	u	2				X	X	X										SO	N 1	44	368355
54SB66B	8·19·04	1125	S	X		1	m	u	2				X	X	X										SO	N 1	44	368356
54SB66C	8·19·04	1145	S	X		1	m	u	2				X	X	X										SO	N 1	44	368357
54SB67A	8·19·04	1240	S	X		1	m	u	2				X	X	X										SO	N 1	44	368358

Box #1			Box #2			Box #3	Box #4	
1. Soil	6. Trip Blank		Y. Yellow / HCl	W. White / None	E. En Core / None	F. Filtered	R. Rush - 3 Day	
2. Sediment	7. Oil		S. Salmon / None	M. Manila / None	O. Other	U. Unfiltered	S. Standard - 28 Day	
3. Surface Water	8. Waste		G. Green / None	DB. Dark Blue / H_2SO_4			T. Timely - 14 Day	
4. Possible Fill	9. Other _____		LB. Lt. Blue / NaOH	LY. Light Yellow / None			O. Other _____	
5. Rinsate			R. Red / HNO_3	RW. Red & White Stripes / HNO_3				

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8·19·04			36440-19
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
[illegible]	8/19/04 8:40			

20 WR2

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(1)

Radford Army Ammunition Plant
Chain of Custody Record

pg 2 of 2

1271 → WR

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000029

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Capen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SW846 CODE	MATRIX CODE	TEST GROUP	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
54SB67B	8.19.04	1300	S	X		1	W	U	1								X								N1	SO	44	368359
54SB67C	8.19.04	1315	S	X		1	W	U	1								X								N1	SO	44	368360
54SB69A	8.19.04	1400	S	X		1	W	U	1								X								N1	SO	44	368361
54SB69B	8.19.04	1410	S	X		1	W	U	1								X								N1	SO	44	368362
54SB69C	8.19.04	1425	S	X		1	W	U	1								X								N1	SO	44	368363
54SB70A	8.19.04	1500	S	X		1	W	U	1								X								N1	SO	44	368364
54SB70B	8.19.04	1515	S	X		1	W	U	1								X								N1	SO	44	logged in to submitted 36440-20
54SB70C	8.19.04	1530	S	X		1	W	U	1								X								N1	SO	44	
DUP-5	8.1904	—	S	X		1	W	U	1								X								FD2	SO	44	
54SB68A	8.19.04	1550	S	X		1	W	U	1								X								N1	SO	44	
54SB68B	8.19.04	1600	S	X		1	W	U	1								X								N1	SO	44	
54SB68C	8.19.04	1610	S	X		1	W	U	1								X								N1	SO	44	

Box #1 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other _____

Box #2 Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Capen	8.19.04 1610			36440-19
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
[illegible]	8/20/04 8:40			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(2)

Radford Army Ammunition Plant
Chain of Custody Record

pg. 2 of 2

1269 → WR2

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000030

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)			REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B67B	8-19-04	1300	S	X		1	M	U	2				X	X	X												See COC #1271
545B67C	8-19-04	1315	S	X		1	M	U	2				X	X	X												For lab ID assignment

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen				36440-19
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
[illegible]	8/20/04 8:40			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

2A

Radford Army Ammunition Plant
Chain of Custody Record

pg 1 of 1 — Cart 6 — 1272 → TM0543

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

00031

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)				REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B69A	8-19-04	1400	S	X		1	M	U	2				X	X	X													See COC#
545B69B	8-19-04	1410	S	X		1	M	U	2				X	X	X													1271 for
545B69C	8-19-04	1425	S	X		1	M	U	2				X	X	X													Lab ID
545B70A	8-19-04	1500	S	X		1	M	U	2				X	X	X													assignment
545B70B	8-19-04	1515	S	X		1	M	U	2				X	X	X													
545B70C	8-19-04	1530	S	X		1	M	U	2				X	X	X													
DUP-5	8-19-04	—	S	X		1	M	U	2				X	X	X													
545B68A	8-19-04	1550	S	X		1	M	U	2				X	X	X													
545B68B	8-19-04	1600	S	X		1	M	U	2				X	X	X													
545B68C	8-19-04	1610	S	X		1	M	U	2				X	X	X													

Lasted in submittal 36440-20

Box #1			
	1. Soil	6. Trip Blank	
	2. Sediment	7. Oil	
	3. Surface Water	8. Waste	
	4. Possible Fill	9. Other _____	
	5. Rinsate		

Box #2		
Y. Yellow / HCl	W. White / None	E. En Core / None
S. Salmon / None	M. Manila / None	O. Other
G. Green / None	DB. Dark Blue / H_2SO_4	
LB. Lt. Blue / NaOH	LY. Light Yellow / None	
R. Red / HNO_3	RW. Red & White Stripes / HNO_3	

Box #3	
F. Filtered	
U. Unfiltered	

Box #4	
R. Rush - 3 Day	
S. Standard - 28 Day	
T. Timely - 14 Day	
O. Other _____	

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8-19-04 1610			36440-19
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Tai Pekos	8/20/04 8:40			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(2B)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army | Project-Submittal No.: (new) add to 36440-19
Receipt Record Page/Line No.: 39-6 | Project Chemist: WJR | Sample Nos.:

Coolers Received

Recorded by (initials/date): LKP 8/20/04 | ☑ Cooler ☐ Box ☐ Other ____ | Qty Received: | ☑ IR Gun (#94) | Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (# ____) | ☐ See Additional Cooler Information Form

Cooler No. TM0998 — Time 9:35

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant/Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	0.0	0	0.0
tb location: representative / in ice			
1	0.3	0	0.3
2	0.1	0	0.1
3	0.8	0	0.8
Average °C			0.4

☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No. TM0929 — Time 10:15

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	1.6	0	1.6
tb location: representative / in ice			
1	1.5	0	1.5
2	2.1	0	2.1
3	2.3	0	2.3
Average °C			1.9

☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No. TM0548 — Time 10:35

Custody Seals: ☑ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	2.5	0	2.5
tb location: representative / in ice			
1	2.7	0	2.7
2	2.1	0	2.1
3	2.2	0	2.2
Average °C			2.3

☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No. TM0153 — Time 10:55

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☑ none / avg 2-3 containers (melted ice water)
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	4.3	0	4.3
tb location: representative / in ice – water			
1	5.3	0	5.3
2	5.0	0	5.0
3	6.4	0	6.4
Average °C			5.6

☑ Cooler ID on COC? ☐ VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos.: 1270, 1271, 1268, 1269, 1267, 1274, 1272
☐ TriMatrix
☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☐	Sample ID matches COC?
☐	☑	Sample date and time matches COC?
☑		Container type completed on COC?
☑	☐	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
		☑	Broken containers/lids?
		☑	Missing or incomplete labels?
		☑	Illegible information on labels?
		☑	Low volume received?
		☑	Inappropriate containers received?
☑		☐	VOC vials have headspace?
☑		☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☐	☑	All sample temperatures ≤4° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☐	☒	Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes This version of checklist applies to COC #s 1268, 1270, 1271, 1269, 1272

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/20/04 8:40	8/20/04 11:30	Yes (No)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST
ADDITIONAL COOLER INFORMATION

Recorded by (initials/date)	Client	Project-Submittal No.
LKP 8/20/04	Radford Army	36440-19
	Receipt Log No. 39-6 / Sample Nos.	Project Chemist CWJR

Cooler No. TM0543 — Time 11:15

Custody Seals
- ☐ none
- ☑ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☑ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☑ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	0.7	0	0.7
tb location: representative / in ice			
1	2.8	0	2.8
2	1.4	0	1.4
3	0.7	0	0.7
		Average °C	1.6

- ☑ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Comments

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-20 **Fraction: Explosives, Nitroglycerin, Pesticides, Polychlorinated Biphenyls, & Metals**

Lab: TriMatrix **Project Name: Radford_SWMU_54**

Reviewer: Andrea_Sansom **Date: November_19,_2004**

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: For the explosive analyses, the continuing calibrations analyzed on column CN displayed percent differences greater than the control limit (i.e., 15%) with a positive bias on 09/04/2004 at 1241 for 1,3-dinitrobenzene at 15.5% and at 1753 for 2,6-dinitrotoluene at 18.0%. The continuing calibrations analyzed on 09/05/2004 displayed percent differences greater than the control limit on column CN with a negative bias for tetryl at 15.2%, 15.3%, and 15.3%. All field sample extracts were non-detect for tetryl on the C18 column that displayed acceptable continuing calibrations. All field samples were non-detect for 1,3-dinitrobenzene and 2,6-dinitrotoluene on one of the two analytical columns despite the positive bias indicated on the CN column. Since only one column is required to pass to report valid non-detect results, no data qualifying action was taken.

For the pesticides analyses, the laboratory control spike for extraction batch 99417-125 displayed percent recoveries greater than the laboratory generated upper control limits for alpha-chlordane at 118% and gamma-chlordane at 119%. Since these recoveries were less than the QAPP upper control limit of 150%, no data qualifying action was taken. The initial calibration verifications displayed percent differences greater than the control limit of 15% for the following:

Date	Time	Instrument	Column	Analyte	Percent Difference	Bias
09/16/2004	1725	158	A	4,4'-DDD	25.0%	-
				4,4'-DDE	16.3%	-
				4,4'-DDT	15.8%	-
				delta-BHC	21.0%	-
				Methoxychlor	21.0%	-
09/22/2004	1209	158	A	delta-BHC	18.0%	+
			B	most analytes	>15%	-

Associated field samples that required both columns for analysis were non-detect and were flagged "UJ,c". The continuing calibrations displayed the following percent differences greater than the control limit of 15%:

Date	Time	Instrument	Column	Analyte	Percent Difference	Bias
09/15/2004	2136	158	B	4,4'-DDD	21.4%	-
				alpha-BHC	15.9%	+
				beta-BHC	16.8%	+
09/16/2004	0332	158	A	4,4'-DDD	18.4%	-
				Methoxychlor	15.9%	-
			B	alpha-BHC	20.3%	+
				beta-BHC	16.0%	+
				gamma-BHC	15.4%	+
09/16/2004	2226	158	A	4,4'-DDD	18.3%	-
				delta-BHC	16.3%	-
09/22/2004	2333	158	A	delta-BHC	15.3%	-
				Endosulfan I	16.6%	+

For the anomalous compounds that displayed a positive bias, the associated field sample results were non-detect, thus, no data qualifying action was taken. For the anomalous compounds that displayed a negative bias, the associated field sample results were reported non-detect from the alternate passing column, unless previously qualified for an initial calibration verification anomaly. Since only one column is required to pass to report a non-detect result, no data qualifying action was necessary. For anomalous compounds that displayed a negative bias on both analytical columns, the associated field sample results were non-detect and were flagged "UJ,c".

For the metals analyses, the instrument initial and/or continuing calibration blanks displayed negative estimate detections less than the reporting limit for barium, iron, manganese, sodium, and vanadium. The positive associated field sample result for sodium was less than five times the absolute value of the blank detection and was flagged "L,o". The associated non-detect results for sodium were flagged "UL,o". The other associated field sample results were positive and greater than five times the absolute value of the negative blank detections, thus, no data qualifying action was required. The initial and/or continuing calibration blanks displayed positive estimate detections less than the reporting limit for aluminum, magnesium, and zinc. The associated field sample results were positive and greater than five times the blank detections, thus, no data qualifying action was required. The method blanks displayed the following detections:

Batch	Analyte	Concentration (mg/Kg)
98711-126	Aluminum	24.4
	Barium	-0.385
	Calcium	18.8
	Iron	7.22
	Magnesium	40.1
	Manganese	-1.23
	Vanadium	-0.589
	Zinc	1.96
98745-127	Antimony	0.042

The positive associated field sample results were less than five times the blank concentration for antimony and were flagged "B,p". The associated calcium and iron field sample results were positive and greater than five times the blank detections, thus, no data qualifying action was required. The other blank detections were attributed to instrument drift; therefore, no data qualifying action was taken. The equipment blank EQB-3 displayed positive estimate detections for chromium at 0.314 ug/L, iron at 9.478 ug/L, and zinc at 7.216 ug/L. The positive equipment blank result for chromium was previously qualified due to a method blank detection and no further data qualifying action was taken. Positive field sample results for iron and zinc were greater than five times the equipment blank detections and no data qualifying action was required. The serial dilution performed on sample 54SB62C displayed percent differences greater than the control limit of 10% for cobalt at 12.3%, magnesium at 11.0%, vanadium at 12.5%, and zinc at 12.3%. The associated field sample results were positive and were flagged "J,s".

Correctable Anomalies: None.

Comments: Due to the abundance of target element lead, the field duplicate DUP-5 was analyzed at a dilution of 50 for this constituent only. The reporting limit for lead was elevated appropriately. If a given fraction was not discussed, no anomalies were encountered. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SWMU54
36440-20

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
368366	54SB70B	8/19/2004	Exp, Pest, PCBs, & Metals
368367	54SB70C	8/19/2004	Exp, Pest, PCBs, & Metals
368368	DUP-5	8/19/2004	Exp, Pest, PCBs, & Metals
368369	54SB68A	8/19/2004	Exp, Pest, PCBs, & Metals
368370	54SB68B	8/19/2004	Exp, Pest, PCBs, & Metals
368371	54SB68C	8/19/2004	Exp, Pest, PCBs, & Metals
368630	54SB65A	8/19/2004	Exp, Pest, PCBs, & Metals
368631	54SB65B	8/19/2004	Exp, Pest, PCBs, & Metals
368632	54SB65C	8/19/2004	Exp, Pest, PCBs, & Metals
368633	54SB62A	8/19/2004	Exp, Pest, PCBs, & Metals
368634	54SB62B	8/19/2004	Exp, Pest, PCBs, & Metals
368635	54SB62C	8/19/2004	Exp, Pest, PCBs, & Metals (+MS/MSD)
368636	DUP-6	8/19/2004	Exp, Pest, PCBs, & Metals

Radford Army Ammunitions Plant
SWMU54
Duplicate Statistics
54SB69B and DUP-5

	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	4xRL	Pass/ Fail
Explosives											
BDL											
Nitroglycerin											
BDL											
Pesticides											
BDL											
PCBs											
BDL											
Metals											
aluminum	mg/Kg	50	250	15800		16600		5%	800	200	Pass
antimony	mg/Kg	0.5	3	0.50	U	0.076	J	147%	0.424	2.0	Pass
arsenic	mg/Kg	0.4	2	1.40		1.30		7.4%	0.10	1.6	Pass
barium	mg/Kg	5.0	25	159		161		1.3%	2.0	20	Pass
beryllium	mg/Kg	1.0	5	0.47	J	0.38	J	21%	0.09	4.0	Pass
cadmium	mg/Kg	1.0	5	2.4		2.5		4.1%	0.1	4.0	Pass
calcium	mg/Kg	250	1250	1750		1910		8.7%	160	1000	Pass
chromium	mg/Kg	5.0	25	24		26		8.0%	2.0	20	Pass
cobalt	mg/Kg	1.0	5	12		13		8.0%	1.0	4.0	Pass
copper	mg/Kg	5.0	25	18		19		5.4%	1.0	20.0	Pass
iron	mg/Kg	10	50	26100		28100		7.4%	2000	40	Pass
lead	mg/Kg	50	250	247		318		25%	71	200	Pass
magnesium	mg/Kg	250	1250	3610		3780		4.6%	170	1000	Pass
manganese	mg/Kg	5	25	864		944		8.8%	80	20	Pass
mercury	mg/Kg	0.1	0.5	0.030	J	0.028	J	6.9%	0.002	0.4	Pass
nickel	mg/Kg	0.5	3	13		14		7.4%	1.0	2.0	Pass
potassium	mg/Kg	100	500	1970		2090		5.9%	120	400	Pass
selenium	mg/Kg	1.0	5	1.0	U	0.13	J	154%	0.87	4.0	Pass
silver	mg/Kg	3.0	15	0.11	J	0.12	J	8.7%	0.01	12.0	Pass
sodium	mg/Kg	100	500	100	U	33	J	101%	67	400	Pass
thallium	mg/Kg	0.5	3	0.35	J	0.35	J	0.0%	0.0	2.0	Pass
vanadium	mg/Kg	1.2	6	38		41		7.6%	3.0	4.8	Pass
zinc	mg/Kg	4.0	20	748		851		13%	103	16	Pass

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

Radford Army Ammunitions Plant
SWMU54
Duplicate Statistics
54SB62B and DUP-6

	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	4xRL	Pass/ Fail
Explosives											
BDL											
Nitroglycerin											
BDL											
Pesticides											
BDL											
PCBs											
BDL											
Metals											
aluminum	mg/Kg	50	250	9330		9140		2.1%	190	200	Pass
arsenic	mg/Kg	0.4	2	0.65		0.63		3.1%	0.02	1.6	Pass
barium	mg/Kg	5.0	25	105		105		0.0%	0.0	20	Pass
beryllium	mg/Kg	1.0	5	0.37	J	0.29	J	24%	0.08	4.0	Pass
cadmium	mg/Kg	1.0	5	1.3		1.3		0.0%	0.0	4.0	Pass
calcium	mg/Kg	250	1250	1470		1410		4.2%	60	1000	Pass
chromium	mg/Kg	5.0	25	16		16		0.0%	0.0	20	Pass
cobalt	mg/Kg	1.0	5	7.0		7.1		1.4%	0.1	4.0	Pass
copper	mg/Kg	5.0	25	7.6		8.0		5.1%	0.4	20.0	Pass
iron	mg/Kg	10	50	15300		15400		0.7%	100	40	Pass
lead	mg/Kg	1.0	5	6.9		6.7		2.9%	0.2	4.0	Pass
magnesium	mg/Kg	250	1250	2510		2550		1.6%	40	1000	Pass
manganese	mg/Kg	5	25	369		375		1.6%	6.0	20	Pass
nickel	mg/Kg	0.5	3	10.0		9.6		4.1%	0.4	2.0	Pass
potassium	mg/Kg	100	500	1160		1140		1.7%	20	400	Pass
silver	mg/Kg	3.0	15	0.048	J	0.050	J	4.1%	0.002	12.0	Pass
thallium	mg/Kg	0.5	3	0.12	J	0.11	J	8.7%	0.01	2.0	Pass
vanadium	mg/Kg	1.2	6	21		21		0.0%	0.0	4.8	Pass
zinc	mg/Kg	4.0	20	52		53		1.9%	1.0	16	Pass

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

URS
Measurement Systems

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/04/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB70B**	QC Batch:	98868 -127
Sample #:	**368366**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/04/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB70C**	QC Batch:	98868 -127
Sample #:	**368367**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	93
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/04/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**DUP-5**	QC Batch:	98868 -127
Sample #:	**368368**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	78
Unit:	mg/kg dry	Dilution Factor:	1.3

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.267
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0673
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0667
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0946
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.128
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.115
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0919
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.150
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0694
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.151
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.225
98-95-3	Nitrobenzene	0.50 U	0.50	0.115
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.115
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0763

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:50
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/20/04 @ 08:40
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Analyzed:	09/04/04 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**54SB68A**	QC Batch:	98870 -131
Sample #:	**368369**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 16:00
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/20/04 @ 08:40
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Analyzed:	09/04/04 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**54SB68B**	QC Batch:	98870 -131
Sample #:	**368370**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	82
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 16:10
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/20/04 @ 08:40
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Analyzed:	09/04/04 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**54SB68C**	QC Batch:	98870 -131
Sample #:	**368371**	Anal. Batch:	221180
Matrix:	Soil	Percent Solids:	77
Unit:	mg/kg dry	Dilution Factor:	1.3

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.267
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0673
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0667
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0946
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.128
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.115
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0919
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.150
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0694
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.151
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.225
98-95-3	Nitrobenzene	0.50 U	0.50	0.115
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.115
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0763

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 17:30
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Analyzed:	09/01/04 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**54SB65A**	QC Batch:	98870 -131
Sample #:	**368630**	Anal. Batch:	221040
Matrix:	Soil	Percent Solids:	88
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB65B**	QC Batch:	98870 -131
Sample #:	**368631**	Anal. Batch:	221040
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB65C**	QC Batch:	98870 -131
Sample #:	**368632**	Anal. Batch:	221040
Matrix:	Soil	Percent Solids:	80
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:45
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Analyzed:	09/01/04 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**54SB62A**	QC Batch:	98870 -131
Sample #:	**368633**	Anal. Batch:	221040
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.226
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0570
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0564
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0801
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.109
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.0972
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0778
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.127
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0587
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.128
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.190
98-95-3	Nitrobenzene	0.50 U	0.50	0.0974
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.0976
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0646

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54SB62B**	QC Batch:	98870 -131
Sample #:	**368634**	Anal. Batch:	221040
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 19:05
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Analyzed:	09/02/04 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**54SB62C**	QC Batch:	98870 -131
Sample #:	**368635**	Anal. Batch:	221040
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8330
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/02/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**Dup-6**	QC Batch:	98870 -131
Sample #:	**368636**	Anal. Batch:	221040
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	1.0 U	1.0	0.246
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.0622
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.0616
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.0874
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.118
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.106
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.0848
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.138
1946-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.0641
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.139
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.208
98-95-3	Nitrobenzene	0.50 U	0.50	0.106
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.106
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.0704

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB70B**	QC Batch:	98864 -127
Sample #:	**368366**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

001295

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB70C**	QC Batch:	98864 -127
Sample #:	**368367**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	93
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

001296

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/27/04 by ASC
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**DUP-5**	QC Batch:	98864 -127
Sample #:	**368368**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	78
Unit:	mg/kg dry	Dilution Factor:	1.3

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.57

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB68A**	QC Batch:	98858 -131
Sample #:	**368369**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

001298

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 16:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB68B**	QC Batch:	98858 -131
Sample #:	**368370**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	82
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 16:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB68C**	QC Batch:	98858 -131
Sample #:	**368371**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	77
Unit:	mg/kg dry	Dilution Factor:	1.3

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.57

001300

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 17:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB65A**	QC Batch:	98858 -131
Sample #:	**368630**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	88
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB65B**	QC Batch:	98858 -131
Sample #:	**368631**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	87
Unit:	mg/kg dry	Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

001302

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
Submittal #:	**36440-20**	Prepared:	08/31/04 by JEO
Submittal:	Soil, Aug 19, 2004	Prep. Method:	USEPA-8332
	RFAAP SWMU 54	Analyzed:	09/06/04 by JMK1
Sample ID:	**54SB65C**	Anal. Method:	USEPA-8332
Sample #:	**368632**	QC Batch:	98858 -131
Matrix:	Soil	Anal. Batch:	221096
Unit:	mg/kg dry	Percent Solids:	80
		Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

001303

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:45
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/21/04 @ 09:10
Submittal #:	**36440-20**	Prepared:	08/31/04 by JEO
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Prep. Method:	USEPA-8332
		Analyzed:	09/05/04 by JMK1
Sample ID:	**54SB62A**	Anal. Method:	USEPA-8332
Sample #:	**368633**	QC Batch:	98858 -131
Matrix:	Soil	Anal. Batch:	221083
Unit:	mg/kg dry	Percent Solids:	87
		Dilution Factor:	1.1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.33

001304

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB62B**	QC Batch:	98858 -131
Sample #:	**368634**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 19:05
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54SB62C**	QC Batch:	98858 -131
Sample #:	**368635**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

001306

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/31/04 by JEO
Submittal #:	**36440-20**	Prep. Method:	USEPA-8332
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/05/04 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**Dup-6**	QC Batch:	98858 -131
Sample #:	**368636**	Anal. Batch:	221083
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1.2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	10 U	10	1.45

001307

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:15
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/20/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Analyzed:	09/15/04 by MSN
		Anal. Method:	USEPA-8081A
Sample ID:	**54SB70B**	QC Batch:	99418 -125
Sample #:	**368366**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	UJ,c	20	2.72
72-55-9	4,4'-DDE	20 U		20	3.29
50-29-3	4,4'-DDT	20 U		20	3.07
309-00-2	Aldrin	20 U		20	2.57
319-84-6	Alpha-BHC	20 U		20	2.88
5103-71-9	A-Chlordane	20 U		20	2.56
5103-74-2	G-Chlordane	20 U		20	2.60
319-85-7	Beta-BHC	20 U		20	3.57
319-86-8	Delta-BHC	20 U		20	2.22
60-57-1	Dieldrin	20 U		20	2.68
959-98-8	Endosulfan I	20 U		20	2.99
33213-65-9	Endosulfan II	20 U		20	1.80
1031-07-8	Endosulfan Sulfate	20 U		20	3.06
72-20-8	Endrin	20 U		20	2.85
7421-93-4	Endrin Aldehyde	20 U		20	2.47
53494-70-5	Endrin Ketone	20 U		20	2.60
58-89-9	Lindane	20 U		20	2.99
76-44-8	Heptachlor	20 U		20	2.80
1024-57-3	Heptachlor Epoxide	20 U		20	3.94
72-43-5	Methoxychlor	20 U		20	5.32
8001-35-2	Toxaphene	320 U		320	78.1

001425

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB70C**	QC Batch:	99418 -125
Sample #:	**368367**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	93
Unit:	ug/kg dry	Dilution Factor:	5.4

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	UJ,c	20	2.58
72-55-9	4,4'-DDE	20 U		20	3.12
50-29-3	4,4'-DDT	20 U		20	2.91
309-00-2	Aldrin	20 U		20	2.43
319-84-6	Alpha-BHC	20 U		20	2.73
5103-71-9	A-Chlordane	20 U		20	2.42
5103-74-2	G-Chlordane	20 U		20	2.47
319-85-7	Beta-BHC	20 U		20	3.39
319-86-8	Delta-BHC	20 U		20	2.10
60-57-1	Dieldrin	20 U		20	2.54
959-98-8	Endosulfan I	20 U		20	2.83
33213-65-9	Endosulfan II	20 U		20	1.70
1031-07-8	Endosulfan Sulfate	20 U		20	2.90
72-20-8	Endrin	20 U		20	2.70
7421-93-4	Endrin Aldehyde	20 U		20	2.34
53494-70-5	Endrin Ketone	20 U		20	2.47
58-89-9	Lindane	20 U		20	2.83
76-44-8	Heptachlor	20 U		20	2.66
1024-57-3	Heptachlor Epoxide	20 U		20	3.74
72-43-5	Methoxychlor	20 U		20	5.04
8001-35-2	Toxaphene	320 U		320	74.0

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**DUP-5**	QC Batch:	99418 -125
Sample #:	**368368**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	6.4

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U UJ,C	20	3.06
72-55-9	4,4'-DDE	20 U	20	3.69
50-29-3	4,4'-DDT	20 U	20	3.44
309-00-2	Aldrin	20 U	20	2.88
319-84-6	Alpha-BHC	20 U	20	3.23
5103-71-9	A-Chlordane	20 U	20	2.87
5103-74-2	G-Chlordane	20 U	20	2.92
319-85-7	Beta-BHC	20 U	20	4.01
319-86-8	Delta-BHC	20 U	20	2.49
60-57-1	Dieldrin	20 U	20	3.01
959-98-8	Endosulfan I	20 U	20	3.35
33213-65-9	Endosulfan II	20 U	20	2.02
1031-07-8	Endosulfan Sulfate	20 U	20	3.44
72-20-8	Endrin	20 U	20	3.20
7421-93-4	Endrin Aldehyde	20 U	20	2.78
53494-70-5	Endrin Ketone	20 U	20	2.92
58-89-9	Lindane	20 U	20	3.35
76-44-8	Heptachlor	20 U	20	3.15
1024-57-3	Heptachlor Epoxide	20 U	20	4.43
72-43-5	Methoxychlor	20 U	20	5.97
8001-35-2	Toxaphene	320 U	320	87.7

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB68A**	QC Batch:	99417 -125
Sample #:	**368369**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	UJ,C	20	2.87
72-55-9	4,4'-DDE	20 U		20	3.46
50-29-3	4,4'-DDT	20 U		20	3.23
309-00-2	Aldrin	20 U		20	2.70
319-84-6	Alpha-BHC	20 U		20	3.03
5103-71-9	A-Chlordane	20 U		20	2.69
5103-74-2	G-Chlordane	20 U		20	2.74
319-85-7	Beta-BHC	20 U		20	3.76
319-86-8	Delta-BHC	20 U		20	2.33
60-57-1	Dieldrin	20 U		20	2.83
959-98-8	Endosulfan I	20 U		20	3.14
33213-65-9	Endosulfan II	20 U		20	1.89
1031-07-8	Endosulfan Sulfate	20 U		20	3.22
72-20-8	Endrin	20 U		20	3.00
7421-93-4	Endrin Aldehyde	20 U		20	2.60
53494-70-5	Endrin Ketone	20 U		20	2.74
58-89-9	Lindane	20 U		20	3.14
76-44-8	Heptachlor	20 U		20	2.95
1024-57-3	Heptachlor Epoxide	20 U		20	4.15
72-43-5	Methoxychlor	20 U		20	5.60
8001-35-2	Toxaphene	320 U		320	82.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 16:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB68B**	QC Batch:	99417 -125
Sample #:	**368370**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	6.1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	UJ,c	20	2.92
72-55-9	4,4'-DDE	20 U		20	3.52
50-29-3	4,4'-DDT	20 U		20	3.28
309-00-2	Aldrin	20 U		20	2.75
319-84-6	Alpha-BHC	20 U		20	3.08
5103-71-9	A-Chlordane	20 U		20	2.74
5103-74-2	G-Chlordane	20 U		20	2.79
319-85-7	Beta-BHC	20 U		20	3.82
319-86-8	Delta-BHC	20 U		20	2.37
60-57-1	Dieldrin	20 U		20	2.87
959-98-8	Endosulfan I	20 U		20	3.20
33213-65-9	Endosulfan II	20 U		20	1.92
1031-07-8	Endosulfan Sulfate	20 U		20	3.28
72-20-8	Endrin	20 U		20	3.05
7421-93-4	Endrin Aldehyde	20 U		20	2.65
53494-70-5	Endrin Ketone	20 U		20	2.79
58-89-9	Lindane	20 U		20	3.20
76-44-8	Heptachlor	20 U		20	3.00
1024-57-3	Heptachlor Epoxide	20 U		20	4.22
72-43-5	Methoxychlor	20 U		20	5.69
8001-35-2	Toxaphene	320 U		320	83.6

001429

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 16:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB68C**	QC Batch:	99417 -125
Sample #:	**368371**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	6.5

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	UJ,c	20	3.11
72-55-9	4,4'-DDE	20 U		20	3.75
50-29-3	4,4'-DDT	20 U		20	3.50
309-00-2	Aldrin	20 U		20	2.93
319-84-6	Alpha-BHC	20 U		20	3.28
5103-71-9	A-Chlordane	20 U		20	2.92
5103-74-2	G-Chlordane	20 U		20	2.97
319-85-7	Beta-BHC	20 U		20	4.08
319-86-8	Delta-BHC	20 U		20	2.53
60-57-1	Dieldrin	20 U		20	3.06
959-98-8	Endosulfan I	20 U		20	3.41
33213-65-9	Endosulfan II	20 U		20	2.05
1031-07-8	Endosulfan Sulfate	20 U		20	3.49
72-20-8	Endrin	20 U		20	3.25
7421-93-4	Endrin Aldehyde	20 U		20	2.82
53494-70-5	Endrin Ketone	20 U		20	2.97
58-89-9	Lindane	20 U		20	3.41
76-44-8	Heptachlor	20 U		20	3.20
1024-57-3	Heptachlor Epoxide	20 U		20	4.50
72-43-5	Methoxychlor	20 U		20	6.06
8001-35-2	Toxaphene	320 U		320	89.1

001430

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 17:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB65A**	QC Batch:	99417 -125
Sample #:	**368630**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.72
72-55-9	4,4'-DDE	20 U	20	3.29
50-29-3	4,4'-DDT	20 U	20	3.07
309-00-2	Aldrin	20 U	20	2.57
319-84-6	Alpha-BHC	20 U	20	2.88
5103-71-9	A-Chlordane	20 U	20	2.56
5103-74-2	G-Chlordane	20 U	20	2.60
319-85-7	Beta-BHC	20 U	20	3.57
319-86-8	Delta-BHC	20 U	20	2.22
60-57-1	Dieldrin	20 U	20	2.68
959-98-8	Endosulfan I	20 U	20	2.99
33213-65-9	Endosulfan II	20 U	20	1.80
1031-07-8	Endosulfan Sulfate	20 U	20	3.06
72-20-8	Endrin	20 U	20	2.85
7421-93-4	Endrin Aldehyde	20 U	20	2.47
53494-70-5	Endrin Ketone	20 U	20	2.60
58-89-9	Lindane	20 U	20	2.99
76-44-8	Heptachlor	20 U	20	2.80
1024-57-3	Heptachlor Epoxide	20 U	20	3.94
72-43-5	Methoxychlor	20 U	20	5.32
8001-35-2	Toxaphene	320 U	320	78.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB65B**	QC Batch:	99417 -125
Sample #:	**368631**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	UJ,C	20	2.72
72-55-9	4,4'-DDE	20 U		20	3.29
50-29-3	4,4'-DDT	20 U		20	3.07
309-00-2	Aldrin	20 U		20	2.57
319-84-6	Alpha-BHC	20 U		20	2.88
5103-71-9	A-Chlordane	20 U		20	2.56
5103-74-2	G-Chlordane	20 U		20	2.60
319-85-7	Beta-BHC	20 U		20	3.57
319-86-8	Delta-BHC	20 U		20	2.22
60-57-1	Dieldrin	20 U		20	2.68
959-98-8	Endosulfan I	20 U		20	2.99
33213-65-9	Endosulfan II	20 U		20	1.80
1031-07-8	Endosulfan Sulfate	20 U		20	3.06
72-20-8	Endrin	20 U		20	2.85
7421-93-4	Endrin Aldehyde	20 U		20	2.47
53494-70-5	Endrin Ketone	20 U		20	2.60
58-89-9	Lindane	20 U		20	2.99
76-44-8	Heptachlor	20 U		20	2.80
1024-57-3	Heptachlor Epoxide	20 U		20	3.94
72-43-5	Methoxychlor	20 U		20	5.32
8001-35-2	Toxaphene	320 U		320	78.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB65C**	QC Batch:	99417 -125
Sample #:	**368632**	Anal. Batch:	221764
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	6.2

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U		20	2.96
72-55-9	4,4'-DDE	20 U		20	3.58
50-29-3	4,4'-DDT	20 U	UJ,c	20	3.34
309-00-2	Aldrin	20 U		20	2.79
319-84-6	Alpha-BHC	20 U		20	3.13
5103-71-9	A-Chlordane	20 U		20	2.78
5103-74-2	G-Chlordane	20 U		20	2.83
319-85-7	Beta-BHC	20 U		20	3.89
319-86-8	Delta-BHC	20 U		20	2.41
60-57-1	Dieldrin	20 U		20	2.92
959-98-8	Endosulfan I	20 U		20	3.25
33213-65-9	Endosulfan II	20 U		20	1.95
1031-07-8	Endosulfan Sulfate	20 U		20	3.33
72-20-8	Endrin	20 U		20	3.10
7421-93-4	Endrin Aldehyde	20 U		20	2.69
53494-70-5	Endrin Ketone	20 U		20	2.83
58-89-9	Lindane	20 U		20	3.25
76-44-8	Heptachlor	20 U		20	3.05
1024-57-3	Heptachlor Epoxide	20 U		20	4.29
72-43-5	Methoxychlor	20 U		20	5.78
8001-35-2	Toxaphene	320 U		320	84.9

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB62A**	QC Batch:	99417 -125
Sample #:	**368633**	Anal. Batch:	221764
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.72
72-55-9	4,4'-DDE	20 U	20	3.29
50-29-3	4,4'-DDT	20 U VJ,C	20	3.07
309-00-2	Aldrin	20 U	20	2.57
319-84-6	Alpha-BHC	20 U	20	2.88
5103-71-9	A-Chlordane	20 U	20	2.56
5103-74-2	G-Chlordane	20 U	20	2.60
319-85-7	Beta-BHC	20 U	20	3.57
319-86-8	Delta-BHC	20 U	20	2.22
60-57-1	Dieldrin	20 U	20	2.68
959-98-8	Endosulfan I	20 U	20	2.99
33213-65-9	Endosulfan II	20 U	20	1.80
1031-07-8	Endosulfan Sulfate	20 U	20	3.06
72-20-8	Endrin	20 U	20	2.85
7421-93-4	Endrin Aldehyde	20 U	20	2.47
53494-70-5	Endrin Ketone	20 U	20	2.60
58-89-9	Lindane	20 U	20	2.99
76-44-8	Heptachlor	20 U	20	2.80
1024-57-3	Heptachlor Epoxide	20 U	20	3.94
72-43-5	Methoxychlor	20 U	20	5.32
8001-35-2	Toxaphene	320 U	320	78.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB62B**	QC Batch:	99417 -125
Sample #:	**368634**	Anal. Batch:	221764
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U		20	2.87
72-55-9	4,4'-DDE	20 U		20	3.46
50-29-3	4,4'-DDT	20 U	UJ,c	20	3.23
309-00-2	Aldrin	20 U		20	2.70
319-84-6	Alpha-BHC	20 U		20	3.03
5103-71-9	A-Chlordane	20 U		20	2.69
5103-74-2	G-Chlordane	20 U		20	2.74
319-85-7	Beta-BHC	20 U		20	3.76
319-86-8	Delta-BHC	20 U		20	2.33
60-57-1	Dieldrin	20 U		20	2.83
959-98-8	Endosulfan I	20 U		20	3.14
33213-65-9	Endosulfan II	20 U		20	1.89
1031-07-8	Endosulfan Sulfate	20 U		20	3.22
72-20-8	Endrin	20 U		20	3.00
7421-93-4	Endrin Aldehyde	20 U		20	2.60
53494-70-5	Endrin Ketone	20 U		20	2.74
58-89-9	Lindane	20 U		20	3.14
76-44-8	Heptachlor	20 U		20	2.95
1024-57-3	Heptachlor Epoxide	20 U		20	4.15
72-43-5	Methoxychlor	20 U		20	5.60
8001-35-2	Toxaphene	320 U		320	82.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 19:05
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/22/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB62C**	QC Batch:	99417 -125
Sample #:	**368635**	Anal. Batch:	221995
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.87
72-55-9	4,4'-DDE	20 U	20	3.46
50-29-3	4,4'-DDT	20 U	20	3.23
309-00-2	Aldrin	20 U	20	2.70
319-84-6	Alpha-BHC	20 U	20	3.03
5103-71-9	A-Chlordane	20 U	20	2.69
5103-74-2	G-Chlordane	20 U	20	2.74
319-85-7	Beta-BHC	20 U	20	3.76
319-86-8	Delta-BHC	20 U	20	2.33
60-57-1	Dieldrin	20 U	20	2.83
959-98-8	Endosulfan I	20 U	20	3.14
33213-65-9	Endosulfan II	20 U	20	1.89
1031-07-8	Endosulfan Sulfate	20 U	20	3.22
72-20-8	Endrin	20 U	20	3.00
7421-93-4	Endrin Aldehyde	20 U	20	2.60
53494-70-5	Endrin Ketone	20 U	20	2.74
58-89-9	Lindane	20 U	20	3.14
76-44-8	Heptachlor	20 U	20	2.95
1024-57-3	Heptachlor Epoxide	20 U	20	4.15
72-43-5	Methoxychlor	20 U	20	5.60
8001-35-2	Toxaphene	320 U	320	82.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/16/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**Dup-6**	QC Batch:	99417 -125
Sample #:	**368636**	Anal. Batch:	221764
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U		20	2.87
72-55-9	4,4'-DDE	20 U		20	3.46
50-29-3	4,4'-DDT	20 U	UJ,C	20	3.23
309-00-2	Aldrin	20 U		20	2.70
319-84-6	Alpha-BHC	20 U		20	3.03
5103-71-9	A-Chlordane	20 U		20	2.69
5103-74-2	G-Chlordane	20 U		20	2.74
319-85-7	Beta-BHC	20 U		20	3.76
319-86-8	Delta-BHC	20 U		20	2.33
60-57-1	Dieldrin	20 U		20	2.83
959-98-8	Endosulfan I	20 U		20	3.14
33213-65-9	Endosulfan II	20 U		20	1.89
1031-07-8	Endosulfan Sulfate	20 U		20	3.22
72-20-8	Endrin	20 U		20	3.00
7421-93-4	Endrin Aldehyde	20 U		20	2.60
53494-70-5	Endrin Ketone	20 U		20	2.74
58-89-9	Lindane	20 U		20	3.14
76-44-8	Heptachlor	20 U		20	2.95
1024-57-3	Heptachlor Epoxide	20 U		20	4.15
72-43-5	Methoxychlor	20 U		20	5.60
8001-35-2	Toxaphene	320 U		320	82.2

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB70B**
Sample #: **368366**
Matrix: Soil
Unit: ug/kg dry

Sampled: 08/19/04 @ 15:15
Sampler: D. Copen
Received: 08/20/04 @ 08:40
Prepared: 08/25/04 by PAK
Prep. Method: USEPA-3550B
Analyzed: 09/01/04 by JLRM
Anal. Method: USEPA-8082
QC Batch: 98837 -125
Anal. Batch: 220848
Percent Solids: 87
Dilution Factor: 1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:30
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/20/04 @ 08:40
Submittal #:	**36440-20**	Prepared:	08/25/04 by PAK
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Prep. Method:	USEPA-3550B
		Analyzed:	09/01/04 by JLRM
Sample ID:	**54SB70C**	Anal. Method:	USEPA-8082
Sample #:	**368367**	QC Batch:	98837 -125
Matrix:	Soil	Anal. Batch:	220848
Unit:	ug/kg dry	Percent Solids:	93
		Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**DUP-5**	QC Batch:	98837 -125
Sample #:	**368368**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	10.5
11104-28-2	PCB-1221	66 U	66	12.2
11141-16-5	PCB-1232	66 U	66	10.8
53469-21-9	PCB-1242	33 U	33	7.28
12672-29-6	PCB-1248	33 U	33	6.89
11097-69-1	PCB-1254	33 U	33	8.84
11096-82-5	PCB-1260	66 U	66	13.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB68A**	QC Batch:	98865 -125
Sample #:	**368369**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 16:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB68B**	QC Batch:	98865 -125
Sample #:	**368370**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 16:10
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/20/04 @ 08:40
Submittal #:	**36440-20**	Prepared:	08/25/04 by PAK
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Prep. Method:	USEPA-3550B
		Analyzed:	09/01/04 by JLRM
Sample ID:	**54SB68C**	Anal. Method:	USEPA-8082
Sample #:	**368371**	QC Batch:	98865 -125
Matrix:	Soil	Anal. Batch:	220848
Unit:	ug/kg dry	Percent Solids:	77
		Dilution Factor:	1.3

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	10.5
11104-28-2	PCB-1221	66 U	66	12.2
11141-16-5	PCB-1232	66 U	66	10.8
53469-21-9	PCB-1242	33 U	33	7.28
12672-29-6	PCB-1248	33 U	33	6.89
11097-69-1	PCB-1254	33 U	33	8.84
11096-82-5	PCB-1260	66 U	66	13.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 17:30
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB65A**	QC Batch:	98865 -125
Sample #:	**368630**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 17:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB65B**	QC Batch:	98865 -125
Sample #:	**368631**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB65C**	QC Batch:	98865 -125
Sample #:	**368632**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB62A**	QC Batch:	98865 -125
Sample #:	**368633**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 18:55
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB62B**	QC Batch:	98865 -125
Sample #:	**368634**	Anal. Batch:	220848
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 19:05
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004 RFAAP SWMU 54	Analyzed:	09/02/04 by JLRM
		Anal. Method:	USEPA-8082
Sample ID:	**54SB62C**	QC Batch:	98865 -125
Sample #:	**368635**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-20**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 19, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**Dup-6**	QC Batch:	98865 -125
Sample #:	**368636**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

End of Analytical Report

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 15:15
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB70B**
Sample #: **368366**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	9110		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.58		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	74		5.0	0.103	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Beryllium, Total	0.40 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.2		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1280		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	17		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	7.6	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	7.2		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	15700		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	7.3		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	2380	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	387		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.10 U		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	9.0		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	918		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.064 J		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.094 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	35 J		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.11 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	21	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	52	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 15:30
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB70C**
Sample #: **368367**
Matrix: Soil

Percent Solids: 93

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	4720		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	1.5		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	44		5.0	0.103	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Beryllium, Total	0.076 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.1		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	843		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	11		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	4.2	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	3.5 J		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	10200		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	12		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	1580	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	226		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.10 U		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	5.7		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	692		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.066 J		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.031 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	100 U		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.50 U		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	12	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	41	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 00:00
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **DUP-5**
Sample #: **368368**
Matrix: Soil

Percent Solids: 78

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	16600		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.076 J	B,P	0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	1.3		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	161		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.38 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	2.5		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1910		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	26		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	13	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	19		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	28100		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	318		50	DFSO 3.88	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	3780	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	944		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.028 J		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	14		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	2090		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.13 J		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.12 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	33 J		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.35 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	41	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	851	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 15:50
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB68A**
Sample #: **368369**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	10400		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.062 J	B,P	0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	1.0		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	166		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.33 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.5		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	2030		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	19		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	8.3	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	9.4		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	20100		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	44		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	2610	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	651		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.026 J		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	11		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1180		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.12 J		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.053 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	34 J		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.22 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	23	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	152	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 16:00
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB68B**
Sample #: **368370**
Matrix: Soil

Percent Solids: 82

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	10900		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.62		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	123		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.37 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.5		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1760		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	20		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	8.3	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	9.2		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	17400		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	8.0		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	2880	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	424		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.10 U		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	12		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1110		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.046 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	37 J		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.14 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	25	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	56	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 16:10
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB68C**
Sample #: **368371**
Matrix: Soil

Percent Solids: 77

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	14600		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.11 J	B,P	0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.78		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	159		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.64 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.3		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	2150		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	27		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	11	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	12		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	22800		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	10		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	3850	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	629		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.015 J		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	15		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1110		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.063 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	41 J		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.15 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	32	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	72	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 17:30
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB65A**
Sample #: **368630**
Matrix: Soil

Percent Solids: 88

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	5900		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.53		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	74		5.0	0.103	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Beryllium, Total	0.18 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	0.87 J		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1110		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	13		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	4.9	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	5.4		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	11300		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	10		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	1860	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	268		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.10 U		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	6.9		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1020		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.053 J		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.037 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	100 U		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.086 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	15	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	53	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 17:45
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB65B**
Sample #: **368631**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	8860		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.62		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	93		5.0	0.103	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Beryllium, Total	0.38 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.2		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1400		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	16		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	7.0	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	7.7		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	15400		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	6.5		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	2630	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	360		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.10 U		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	10		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1140		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.046 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	100 U		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.12 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	21	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	52	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 18:00
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB65C**
Sample #: **368632**
Matrix: Soil

Percent Solids: 80

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	12900		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.051 J	B,P	0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.69		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	131		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.50 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.3		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1950		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	25		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	9.2	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	10		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	20100		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	8.1		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	3270	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	473		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.010 J		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	13		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1170		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.057 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	100 U		100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.14 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	29	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	64	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 18:45
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB62A**
Sample #: **368633**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	7750		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.63		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	125		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.26 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.1		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1580		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	16		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	6.3	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	7.4		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	13600		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	14		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	2140	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	418		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.014 J		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	9.2		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1120		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	0.088 J		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.043 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	40 J	L,O	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.10 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	19	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	68	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 18:55
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB62B**
Sample #: **368634**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	9330		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.65		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	105		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.37 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.3		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1470		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	16		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	7.0	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	7.6		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	15300		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	6.9		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	2510	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	369		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.10 U		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	10		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1160		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.048 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	100 U	UL,o	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.12 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	21	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	52	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 19:05
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB62C**
Sample #: **368635**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	11100		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.73		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	121		5.0	0 103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.33 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.3		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1620		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	19		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
* Cobalt, Total	8.1	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	8.7		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	17300		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	7.9		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
* Magnesium, Total	2730	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	451		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.0081 J		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	12		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1170		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.056 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	100 U	UL,O	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.14 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
* Vanadium, Total	24	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
* Zinc, Total	57	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

* See attached Statement of Data Qualifications.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 00:00
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **Dup-6**
Sample #: **368636**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	9140		50	4.20	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0386	mg/kg dry	09/02/04	DWJ	USEPA-6020
Arsenic, Total	0.63		0.40	0.0580	mg/kg dry	09/01/04	DWJ	USEPA-6020
Barium, Total	105		5.0	0.103	mg/kg dry	09/02/04	DSC	USEPA-6010B
Beryllium, Total	0.29 J		1.0	0.0267	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cadmium, Total	1.3		1.0	0.250	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Calcium, Total	1410		250	17.5	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Chromium, Total	16		5.0	0.998	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Cobalt, Total	7.1	J,S	1.0	0.233	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Copper, Total	8.0		5.0	0.516	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Iron, Total	15400		10	0.731	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Lead, Total	6.7		1.0	0.0776	mg/kg dry	09/01/04	DWJ	USEPA-6020
Magnesium, Total	2550	J,S	250	7.67	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Manganese, Total	375		5.0	0.474	mg/kg dry	09/02/04	DSC	USEPA-6010B
Mercury, Total	0.10 U		0.10	0.0077	mg/kg dry	08/30/04	KLVM	USEPA-7471A
Nickel, Total	9.6		0.50	0.0775	mg/kg dry	09/01/04	DWJ	USEPA-6020
Potassium, Total	1140		100	7.79	mg/kg dry	09/02/04	DSC	USEPA-6010B
Selenium, Total	1.0 U		1.0	0.0486	mg/kg dry	09/01/04	DWJ	USEPA-6020
Silver, Total	0.050 J		3.0	0.0178	mg/kg dry	09/01/04	DWJ	USEPA-6020
Sodium, Total	100 U	UL,O	100	31.4	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Thallium, Total	0.11 J		0.50	0.0733	mg/kg dry	09/01/04	DWJ	USEPA-6020
Vanadium, Total	21	J,S	1.2	0.401	mg/kg dry	08/30/04	DWJ	USEPA-6010B
Zinc, Total	53	J,S	4.0	0.789	mg/kg dry	09/02/04	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/19/04 @ 15:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/20/04 @ 08:40
Submittal #:	**36440-20**		
Submittal:	Soil, Aug 19, 2004		
	RFAAP SWMU 54		
Sample ID:	**54SB70B**		
Sample #:	**368366**		
Matrix:	Soil	Percent Solids:	87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	87	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

002695

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 15:30
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB70C**
Sample #: **368367**
Matrix: Soil

Percent Solids: 93

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	93	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

002696

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 00:00
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **DUP-5**
Sample #: **368368**
Matrix: Soil

Percent Solids: 78

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	78	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

002697

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 15:50
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB68A**
Sample #: **368369**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	83	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

002698

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 16:00
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB68B**
Sample #: **368370**
Matrix: Soil

Percent Solids: 82

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	82	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

002699

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 16:10
Sampler: D. Copen
Received: 08/20/04 @ 08:40

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB68C**
Sample #: **368371**
Matrix: Soil

Percent Solids: 77

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	77	0.1	0.1	%	08/23/04	JMJ	SW-846 3550B

002700

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 17:30
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB65A**
Sample #: **368630**
Matrix: Soil

Percent Solids: 88

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	88	0.1	0.1	%	08/26/04	JMJ	SW-846 3550B

002701

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 17:45
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB65B**
Sample #: **368631**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	87	0.1	0.1	%	08/26/04	JMJ	SW-846 3550B

002702

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 18:00
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB65C**
Sample #: **368632**
Matrix: Soil

Percent Solids: 80

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	80	0.1	0.1	%	08/26/04	JMJ	SW-846 3550B

002703

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 18:45
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB62A**
Sample #: **368633**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	87	0.1	0.1	%	08/26/04	JMJ	SW-846 3550B

002704

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 18:55
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB62B**
Sample #: **368634**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	84	0.1	0.1	%	08/26/04	JMJ	SW-846 3550B

002705

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 19:05
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **54SB62C**
Sample #: **368635**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	83	0.1	0.1	%	08/26/04	JMJ	SW-846 3550B

002706

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/19/04 @ 00:00
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-20**
Submittal: Soil, Aug 19, 2004
RFAAP SWMU 54
Sample ID: **Dup-6**
Sample #: **368636**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	84	0.1	0.1	%	08/26/04	JMJ	SW-846 3550B

002707

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DATA VALIDATION WORKSHEET

Reviewer: Andrea Sansom
Date: 11/17/2004
DV Level: II III IV
Review Document:
_X_ Region III Modified for National Functional Guidelines
___ NFG for organic Data review (February 1994)
_X_ Project QAPP/SAP

Explosives

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-20
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids (for		X	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: *Three coolers at 2.5C, 4.3C and 4.5C.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	X		

Notes: *EQB-1, EQB-2, and EQB-3 are non-detect*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		X	
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?		X	
6.4	Are there any RPD for MS/MSD recoveries outside the QC limits not to exceed 60%?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 54SB62C MS MSD RPD

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			X
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54SB69B and DUP-5*

54SB62B and DUP-6

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	X		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.			X
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		X		
	Number of samples:	13			
	Number of target compounds in each analysis:	14			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: Andrea Sansom
Date: 11/17/2004
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-20
Test Name: Nitroglycerin
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids (for		X	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	X		
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: *Three coolers at 2.5C, 4.3C and 4.5C.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	X		

Notes: *EQB-1, EQB-2, and EQB-3 are non-detect*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD).		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: *54SB62C*

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54SB69B and DUP-5*
54SB62B and DUP-6

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 13			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: Andrea Sansom
Date: November 17, 2004
DV Level: II III IV

Review Document:

X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-20
Test Name: PEST/PCB
Method No.: 8081A/8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Do any soil samples contain more than 50% water?	X		
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		X	

Notes: *Three coolers at 2.5C, 4.3C and 4.5C.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	X		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	X		

Notes: *EQB-1, EQB-2, EQB-3, & EQB-4 are non-detect*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	X		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	X		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		Pest	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows? If No, the associated sample result should be carefully evaluated.	X		

Notes:

5.0 GC/ECD Instrument Performance Check for Pesticides		Yes	No	NA
5.1	Is the 4,4'-DDT breakdown </= to 15%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	X		
5.2	Is the endrin breakdown </= to 15%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	X		

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	X		
6.3	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	X		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			X
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			X

	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
	1 out	high/low	No action	No action
	2 out	2 high same column	K	No action
		2 low same column	L, UL	No action
		mixed same column	J, UJ	No action
		2 high diff columns	J	Not applicable
		2 low diff columns	J, UJ	Not applicable
		mixed diff columns	Professional judgement	Not applicable
	3 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		2 high, 1 low	K (2 high)	J (1 low 2nd column)
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
		other mixed	J, UJ	Not applicable
	4 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		Mixed	J, UJ	Not applicable
	If any recovery is >0% and <10% then L(+)/R(-).			
	If any recovery is 0% then R(+/-).			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 30-150%?		X	
7.4	Are there any RPDs outside the QC limits not to exceed 60%?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 54SB62C MS MSD RPD

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	X		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 30-150%?		X	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			X
	If Yes, J(+) only.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54SB69B and DUP-5*
54SB62B and DUP-6

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).			X
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	X		

Notes:

11.0 Pesticide Cleanup Checks		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes: *CLP requirement, not provided*

Case narrative indicates mercury was used to remove sulfur due to the possibility of degradation of some pesticide target analytes with use of the recommended cleanup with activated copper.

12.0 Data Completeness				Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	Pest	PCB	X		
	Number of samples:	13	13			
	Number of target compounds in each analysis:	21	7			
	Number of results rejected and not reported:	0	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)					
	% Completeness =	100%	100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP/ICPMS/CVAA
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-20
Project No.: 21355035.20001

Project Name: Radford SWMU54
Reviewer: Andrea Sansom
Date: 11/17/2004

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	x			x			x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x			x			x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x			x			x	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)	x			x			x		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	x			x			x		

Note:

Three coolers at 2.5C, 4.3C and 4.5C.

2.0 Holding Time		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		x			x			x	

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".	7+BLK			4+BLK			5+BLK		
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).	x			x			x		
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	x			x			x		
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based	x			x			x		
3.5	Were ICV/CCV reported from mutiple exposures (3 for ICP or 2 for CVAA) with passing %RSD (ICP < 5% or CVAA < 10%)? If no, contact project chemist for laboratory resolution.	x			x			x		
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP: 90%-110% & Hg: 80-120%	x			x			x		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%									
3.7	For one point curves on ICP & ICPMS, did the CRDL standard recover between 80-120%?			x			x	90%		
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K									

Note: *TriMatrix incorporated a higher calibration standard to limit the number of required analytical dilutions for Al, Ba, Ca, Fe, Mn, and K.*

TriMatrix felt this would affect the low end of the curve creating more error at the non-detect detection limit of an acceptable CCB or MB.

TriMatrix elevated these reporting limits by a factor of five for this reason, while still meeting the project DQOs.

URS requested a new MDL study or processing through the new curve and/or to elevate the MDL as well.

Evaluation of the CCBs and MB was performed down to the MDL for both positive and negative detections.

4.0 Blanks

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	x			x			x		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	x			x			x		
4.3	Are there reported MB or ICB/CCBs values > MDL?	x			x				x	
	Sample Results > MDL									
	< 5X Blank Contamination B									
4.4	Are there negative blank results with the absolute value > MDL?		x		x				x	
	Sample Results Non-detects > MDL									
	< 5X absolute Blank Contamination UL L									
4.5	Are there reported field blank > ± MDL?	x			x				x	
	Sample Results > MDL									
	< 5X Blank Contamination B									

Note:

EQB-3 Cr 0.3 J B,p
Fe 9.5 J
Zn 7.2 J L,o

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	x			x					
5.2	Are the ICS AB recoveries within 80% - 120%?	x			x					
5.3	Are the results for unspiked analytes (in ICS A) < ± MDL?		x			x				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?		x			x				
	If not...									
	Action: Not Spiked Analytes < -IDL L(+)/UL(-) > IDL K(+)									
	Spiked analytes (ICS AB analytes) < 50% L(+)/R(-) 50% - 79% L(+)/UL(-) >120% K(+)									

Note:

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	x			x			x		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		x			x			x	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)									

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	x			x			x		
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.									
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	x			x			x		

Note: *54SB62C*

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	x			x			x		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?	x			x			x		
	%R > 125% / 30%< %R < 74% / < 30%									
	Positive: K / L / L									
	Non-detect: None / UL / R									
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	x			x					x

Note: *54SB62C - MS/MSD/RPD/PDS - passed*

9.0 Instrument Detection Limits (IDL)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	x			x			x		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	x			x					
10.2	Was a five-fold dilution performed?	x			x					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).	x				x				

Note: *54SB62C - Co by 6010B @ 12.3%, Mg by 6010B @ 11.0% , V by 6010B @ 12.5% , and Zn by 6010B @ 12.3%*

11.0 Field Duplicate Samples

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	X			X			X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.									
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report	X			X			X		

Note: *54SB69B and DUP-5*

54SB62B and DUP-6

12.0 Result Verification/ Internal Standards/ Tune

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	X			X			X		
12.2	Were all dilutions reflected in the positive results and detection limits?	X					X			X
12.3	Were the Internal Standard recoveries within 30-120% (6020) or 80-120% (6010B)?	X			X					
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	X								
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	X								
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	X								

Note:

13.0 Completeness Calculation

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	X			X			X		
13.1.1	Number of samples: 13									
13.1.2	Number of target compounds in each analysis: 23									
13.1.3	Number of results rejected and not reported: 0									
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%									

Note:

Radford Army Ammunition Plant
Chain of Custody Record

pg 2 of 2

1271 → WR

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000025

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
Lab Sample ID

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA CODE	MATRIX CODE	TEST GROUP	
54SB67B	8-19-04	1300	S	X		1	W	U	1								X								N1	SO	44	
54SB67C	8-19-04	1315	S	X		1	W	U	1								X								N1	SO	44	See
54SB69A	8-19-04	1400	S	X		1	W	U	1								X								N1	SO	44	Submittal
54SB69B	8-19-04	1410	S	X		1	W	U	1								X								N1	SO	44	36440-19
54SB69C	8-19-04	1425	S	X		1	W	U	1								X								N1	SO	44	For log in
54SB70A	8-19-04	1500	S	X		1	W	U	1								X								N1	SO	44	these samples
54SB70B	8-19-04	1515	S	X		1	W	U	1								X								N1	SO	44	368366
54SB70C	8-19-04	1530	S	X		1	W	U	1								X								N1	SO	44	368367
DUP-5	8-1904	—	S	X		1	W	U	1								X								FD	SO	44	368368
54SB68A	8-19-04	1550	S	X		1	W	U	1								X								N1	SO	44	368369
54SB68B	8-19-04	1600	S	X		1	W	U	1								X								N1	SO	44	368370
54SB68C	8-19-04	1610	S	X		1	W	U	1								X								N1	SO	44	368371

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8-19-04 1610			WR 36440-1920
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
[illegible]	8/20/04 8:40			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(2)

Radford Army Ammunition Plant
Chain of Custody Record

pg 1 of 1

1272 → (WR)

Lab to

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000026

Project Number: SWMU 54	Project Name: RFAAP
Project Contact (Name and Phone Number): Darren Renne 804.965.9000	
Samplers: David Copen & John Spangler	

Lab Contact: Walt Roudebush 616.975.4561
AIRBILL No:
Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)				REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
545B69A	8-19-04	1400	S	X		1	M	U	2				X	X	X													See COC#
545B69B	8-19-04	1410	S	X		1	M	U	2				X	X	X													1271 for
545B69C	8-19-04	1425	S	X		1	M	U	2				X	X	X													Lab ID
545B70A	8-19-04	1500	S	X		1	M	U	2				X	X	X													assignment
545B70B	8-19-04	1515	S	X		1	M	U	2				X	X	X													
545B70C	8-19-04	1530	S	X		1	M	U	2				X	X	X													
DUP-5	8-19-04	—	S	X		1	M	U	2				X	X	X													
545B68A	8-19-04	1550	S	X		1	M	U	2				X	X	X													
545B68B	8-19-04	1600	S	X		1	M	U	2				X	X	X													
545B68C	8-19-04	1610	S	X		1	M	U	2				X	X	X													

ANALYSES

Logged in to 36440-19

Logged into Submitted 36440-20

Box #1			
1. Soil	6. Trip Blank		
2. Sediment	7. Oil		
3. Surface Water	8. Waste		
4. Possible Fill	9. Other _____		
5. Rinsate			

Box #2		
Y. Yellow / HCl	W. White / None	E. En Core / None
S. Salmon / None	M. Manila / None	O. Other
G. Green / None	DB. Dark Blue / H_2SO_4	
LB. Lt. Blue / NaOH	LY. Light Yellow / None	
R. Red / HNO_3	RW. Red & White Stripes / HNO_3	

Box #3	
F. Filtered	
U. Unfiltered	

Box #4	
R. Rush - 3 Day	
S. Standard - 28 Day	
T. Timely - 14 Day	
O. Other _____	

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Copen	8-19-04 1610			(WR) 36440-1920
1. Received by:	Date/time	2. Received by:	Date/Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Tai Pekos	8/20/04 8:40			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(2B)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army | Project-Submittal No.: (new) / add to 36440-19 20
Receipt Record Page/Line No.: 39-6 | Project Chemist: WDR | Sample Nos.:

Coolers Received

Recorded by (initials/date): LKP 8/20/04 | ☑ Cooler ☐ Box ☐ Other ____ | Qty Received: | ☑ IR Gun (#94) | Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (# ____) | ☐ See Additional Cooler Information Form

Cooler No. TM0998 — Time 9:35

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant/Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	0.0	0	0.0
tb location: representative (in ice)			
1	0.3	0	0.3
2	0.1	0	0.1
3	0.8	0	0.8
Average °C			0.4

☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No. TM0929 — Time 10:15

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	1.6	0	1.6
tb location: representative (in ice)			
1	1.5	0	1.5
2	2.1	0	2.1
3	2.3	0	2.3
Average °C			1.9

☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No. TM0548 — Time 10:35

Custody Seals: ☑ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	2.5	0	2.5
tb location: representative (in ice)			
1	2.7	0	2.7
2	2.1	0	2.1
3	2.2	0	2.2
Average °C			2.3

☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No. TM0153 — Time 10:55

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	4.3	0	4.3
tb location: representative (in ice) - water			
1	5.3	0	5.3
2	5.0	0	5.0
3	6.4	0	6.4
Average °C			5.6

☑ Cooler ID on COC? ☐ VOC trip blank received?

Melted ice

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos. 1270, 1271, 1268, 1269, 1267, 1274, 1272

☐ TriMatrix
☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	■	Sample ID matches COC?
☐	■	Sample date and time matches COC?
☑		Container type completed on COC?
☑	■	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
		☑	Broken containers/lids?
		☑	Missing or incomplete labels?
		☑	Illegible information on labels?
		☑	Low volume received?
		☑	Inappropriate containers received?
☑		☐	VOC vials have headspace?
☑		☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☐	☑	All sample temperatures ≤4° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☐	■	Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes This version of checklist applies to COC #s ~~1268~~, ~~1270~~, 1271, 1269, 1272

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/20/04 8:40	8/20/04 11:30	Yes (No)

000030

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST
ADDITIONAL COOLER INFORMATION

Recorded by (initials/date): LKP 8/20/04

Client: Radford Army

Receipt Log No.: 39-6

Sample Nos.:

Project-Submittal No.: 36440-1920

Project Chemist: WJR

Cooler No. TM0543 — Time 11:15

Custody Seals
- ☐ none
- ☑ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☑ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☑ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	0.7	0	0.7
tb location: representative / in ice			
1	2.8	0	2.8
2	1.4	0	1.4
3	0.7	0	0.7
		Average °C	1.6

- ☑ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Comments

000031

Radford Army Ammunition Plant
Chain of Custody Record

004

pg. 1 of 1

Cart 8

~~TM0730~~ TM0884

Trimatrix Laboratory
Coporate Exchange Ct. SE
Grand Rapids, MI 49512

00032

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Capen & John Springler

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA Code	Matrix Code	Test Group	Lab Sample ID
545B65A	8.19.04	1730	S	X		1	W	U	1								X							N1			
↓	↓	↓	S	X		1	M	U	2				X	X	X									↓	50	44	36826-20
545B65B	8.19.04	1745	S	X		1	W	U	1								X							N1			
↓	↓	↓	S	X		1	M	U	2				X	X	X									↓	50	44	36826-21
545B65C	8.19.04	1800	S	X		1	W	U	1								X							N1			
↓	↓	↓	S	X		1	M	U	2				X	X	X									↓	50	44	36826-22
545B62A	8.19.04	1845	S	X		1	W	U	1								X							N1			
↓	↓	↓	S	X		1	M	U	2				X	X	X									↓	50	44	36826-23
545B62B	8.19.04	1855	S	X		1	W	U	1								X							N1			
↓	↓	↓	S	X		1	M	U	2				X	X	X									↓	50	44	36826-24
545B62C & MS MSD	8.19.04	1905	S	X		1	W	U	1								X							N1			
↓	↓	↓	S	X		1	M	U	5				X	X	X									↓	50	44	36826-25
DUP-6	8.19.04	—	S	X		1	W	U	1								X							N1			
~~EB~~ ↓	↓	—	S	X		1	M	U	2				X	X	X									↓	50	44	36826-26

ANALYSES

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
Lab Sample ID

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by: David Capen — Date/time: 8.20.04 1945
2. Relinquished by: — Date/Time:
1. Received by: Jai Pokar — Date/time: 8/21/04 9:10
2. Received by: — Date/Time:

Additional Comments:
36440-20

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army | Project-Submittal No.: new / (add to) 36440-20
Receipt Record Page/Line No.: 41-3 | Project Chemist: WAR | Sample Nos.:

Coolers Received

Recorded by (initials/date): LKP 8/21/04

☑ Cooler ☐ Box ☐ Other ____ | Qty Received: 5

☑ IR Gun (#94) | Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (#____) | ☐ See Additional Cooler Information Form

Cooler No.	Time	Custody Seals	Coolant Location	Coolant/Temperature Taken Via	Alternate Temperature Taken Via
#1	10:50	☑ none ☐ present / intact ☐ present / not intact	Dispersed / Top / (Middle) / Bottom	☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container
TM0739	10:55	☑ none ☐ present / intact ☐ present / not intact	Dispersed / (Top) / Middle / Bottom	☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container
TM0884	11:10	☑ none ☐ present / intact ☐ present / not intact	(Dispersed / Top / Middle / Bottom)	☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container
TM0912	11:25	☐ none ☐ present / intact ☐ present / not intact	Dispersed / Top / (Middle) / Bottom	☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container

Cooler No.	Recorded °C	Correction Factor °C	Actual °C
#1	tb 11.3	0	11.3
	tb location: (representative) / in ice		
	1 12.6	0	12.6
	2 11.8	0	11.8
	3 14.9	0	14.9
		Average °C	13.1
	☑ Cooler ID on COC?		
	☐ VOC trip blank received?		
TM0739	tb 8.9	0	8.9
	tb location: representative / in ice		
	1 7.9	0	7.9
	2 8.3	0	8.3
	3 7.8	0	7.8
		Average °C	8.0
	☑ Cooler ID on COC?		
	☐ VOC trip blank received?		
TM0884	tb 4.5	0	4.5
	tb location: representative / in ice		
	1 4.3	0	4.3
	2 3.2	0	3.2
	3 4.6	0	4.6
		Average °C	4.0
	☑ Cooler ID on COC?		
	☐ VOC trip blank received?		
TM0912	tb 14.6	0	14.6
	tb location: (representative) / in ice		
	1 13.7	0	13.7
	2 14.2	0	14.2
	3 15.0	0	15.0
		Average °C	14.3
	☑ Cooler ID on COC?		
	☐ VOC trip blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos.

☐ TriMatrix

☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☐	
☐	☒	Sample ID matches COC?
☐	☒	Sample date and time matches COC?
☐		Container type completed on COC?
☑	☒	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
		☐	Broken containers/lids?
	☑	☐	Missing or incomplete labels?
	☑	☐	Illegible information on labels?
	☑	☐	Low volume received?
	☐	☑	Inappropriate containers received?
☑		☐	VOC vials have headspace?
☑		☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☐	☑	All sample temperatures ≤4° C?
☑	☐		Completed Sample Preservation Verification Form?
☑	☐		Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

This version of checklist applies to COC 004

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/21/04 9:10	8/21/04 11:50	Yes (No)

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-21 **Fraction:** Pesticides_&_Polychlorinated_Biphenyls

Lab: TriMatrix **Project Name:** Radford_SWMU_54

Reviewer: Andrea_Sansom **Date:** November_22,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: For the pesticides analyses, the laboratory control spike for extraction batch 98680-128 displayed percent recoveries greater than the laboratory generated upper control limits for alpha-chlordane at 119% and gamma-chlordane at 121%. Since these recoveries were less than the QAPP upper control limit of 150%, no data qualifying action was taken. The initial calibration verification analyzed on instrument 158 on 09/22/2004 at 1209 displayed percent differences greater than the control limit of 15% for delta-BHC with a positive bias on column A and for several analytes with a negative bias on column B. Associated field sample results were non-detect on column A and non-detect for delta-BHC on column B. Since only one column is required to report valid non-detects, no data qualifying action was required. The continuing calibrations displayed the following percent differences greater than the control limit of 15%:

Date	Time	Instrument	Column	Analyte	Percent Difference	Bias
09/14/2004	2022	158	A	4,4'-DDD	19.6%	-
				4,4'-DDE / Endosulfan I	22.7%	+
				Methoxychlor	17.0%	-
			B	Aldrin	15.5%	+
				alpha-BHC	20.2%	+
				beta-BHC	19.3%	+
				gamma-BHC	17.5%	+
				Endosulfan I	20.6%	+
				Heptachlor	15.3%	+
09/15/2004	0150	158	A	4,4'-DDE / Endosulfan I	17.9%	+
			B	Aldrin	21.1%	+
				alpha-BHC	27.5%	+
				beta-BHC	25.3%	+
				delta-BHC	20.1%	+
				gamma-BHC	23.2%	+
				Endosulfan I	20.8%	+
				Heptachlor	20.2%	+
				Heptachlor epoxide	16.1%	+

Date	Time	Instrument	Column	Analyte	Percent Difference	Bias
09/15/2004	2136	158	B	4,4'-DDD	21.4%	-
				alpha-BHC	15.9%	+
				beta-BHC	16.8%	+
09/22/2004	2333	158	A	delta-BHC	15.3%	-
				Endosulfan I	16.6%	+

For the anomalous compounds that displayed a positive bias, the associated field sample results were non-detect, thus, no data qualifying action was taken. For the anomalous compounds that displayed a negative bias, the associated field sample results were reported non-detect from the alternate passing column. Since only one column is required to pass to report a non-detect result, no data qualifying action was necessary.

The field sample 54SB73A displayed a surrogate percent recovery greater than the laboratory generated upper control limit of 137% for tetrachloro-m-xylene at 139%. Since this percent recovery was less than the QAPP upper limit of 150%, no data qualifying action was taken.

The relative percent difference between the two analytical column concentrations was greater than the control limit of 40% for endrin aldehyde in sample 54SB73A at 48%. This result was flagged "J,g".

For the polychlorinated biphenyls analyses, the representative continuing calibration analyzed on 09/01/2004 at 2252 on column A displayed a percent difference greater than the control limit of 15% for PCB-1016 with a positive bias at 15.8%. Positive associated aroclor results were flagged "J,c". The continuing calibration analyzed on 09/03/2004 at 1334 on column B displayed a mean percent difference greater than the control limit for PCB-1254 with a positive bias at 17.7%. The associated positive PCB-1254 result for sample 54SB72A was flagged "J,c".

The matrix spike pair performed on field sample 54SB73C displayed percent recoveries (136%/136%) greater than the laboratory generated upper control limit of 134% for PCB-1260. Since these percent recoveries were less than the QAPP upper control limit of 150%, no data qualifying action was taken.

Correctable Anomalies: None.

Comments: All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SWMU54
36440-21

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
368637	DUP-7	8/20/2004	Pesticides and PCBs
368638	54SB72A	8/20/2004	Pesticides and PCBs
368639	54SB72B	8/20/2004	Pesticides and PCBs
368640	54SB72C	8/20/2004	Pesticides and PCBs
368641	54SB75A	8/20/2004	Pesticides and PCBs
368642	54DB75B	8/20/2004	Pesticides and PCBs
368643	54SB75C	8/20/2004	Pesticides and PCBs
368644	54SB76C	8/20/2004	Pesticides and PCBs
368645	54SB73A	8/20/2004	Pesticides and PCBs
368646	53SB73B	8/20/2004	Pesticides and PCBs
368647	54SB73C	8/20/2004	Pesticides and PCBs (+MS/MSD)
368648	54SB74A	8/20/2004	Pesticides and PCBs
368649	54SB74B	8/20/2004	Pesticides and PCBs
368650	54SB74C	8/20/2004	Pesticides and PCBs
368651	54SB71A	8/20/2004	Pesticides and PCBs
368652	54SB71B	8/20/2004	Pesticides and PCBs
368653	54SB71C	8/20/2004	Pesticides and PCBs
368654	DUP-8	8/20/2004	Pesticides and PCBs

Radford Army Ammunitions Plant
SWMU54
Duplicate Statistics

54SB76C and DUP-7

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Pesticides									
Endrin aldehyde	ug/Kg	20	100	4.2 J	20 U	131%	15.8	80	Pass
PCBs									
1254	ug/Kg	33	165	33 U	12 J	93%	21	132	Pass

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

URS
Measurement Systems

Radford Army Ammunitions Plant
SWMU54
Duplicate Statistics

54SB74A and DUP-8

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Pesticides									
BDL									
PCBs									
BDL									

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

URS
Measurement Systems

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/14/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**DUP-7**	QC Batch:	99417 -125
Sample #:	**368637**	Anal. Batch:	221766
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	5.9

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.82
72-55-9	4,4'-DDE	20 U	20	3.40
50-29-3	4,4'-DDT	20 U	20	3.17
309-00-2	Aldrin	20 U	20	2.66
319-84-6	Alpha-BHC	20 U	20	2.98
5103-71-9	A-Chlordane	20 U	20	2.65
5103-74-2	G-Chlordane	20 U	20	2.70
319-85-7	Beta-BHC	20 U	20	3.70
319-86-8	Delta-BHC	20 U	20	2.30
60-57-1	Dieldrin	20 U	20	2.78
959-98-8	Endosulfan I	20 U	20	3.09
33213-65-9	Endosulfan II	20 U	20	1.86
1031-07-8	Endosulfan Sulfate	20 U	20	3.17
72-20-8	Endrin	20 U	20	2.95
7421-93-4	Endrin Aldehyde	20 U	20	2.56
53494-70-5	Endrin Ketone	20 U	20	2.70
58-89-9	Lindane	20 U	20	3.09
76-44-8	Heptachlor	20 U	20	2.90
1024-57-3	Heptachlor Epoxide	20 U	20	4.08
72-43-5	Methoxychlor	20 U	20	5.50
8001-35-2	Toxaphene	320 U	320	80.8

000037

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 10:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/14/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB72A**	QC Batch:	99417 -125
Sample #:	**368638**	Anal. Batch:	221766
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.72
72-55-9	4,4'-DDE	20 U	20	3.29
50-29-3	4,4'-DDT	20 U	20	3.07
309-00-2	Aldrin	20 U	20	2.57
319-84-6	Alpha-BHC	20 U	20	2.88
5103-71-9	A-Chlordane	20 U	20	2.56
5103-74-2	G-Chlordane	20 U	20	2.60
319-85-7	Beta-BHC	20 U	20	3.57
319-86-8	Delta-BHC	20 U	20	2.22
60-57-1	Dieldrin	20 U	20	2.68
959-98-8	Endosulfan I	20 U	20	2.99
33213-65-9	Endosulfan II	20 U	20	1.80
1031-07-8	Endosulfan Sulfate	20 U	20	3.06
72-20-8	Endrin	20 U	20	2.85
7421-93-4	Endrin Aldehyde	20 U	20	2.47
53494-70-5	Endrin Ketone	20 U	20	2.60
58-89-9	Lindane	20 U	20	2.99
76-44-8	Heptachlor	20 U	20	2.80
1024-57-3	Heptachlor Epoxide	20 U	20	3.94
72-43-5	Methoxychlor	20 U	20	5.32
8001-35-2	Toxaphene	320 U	320	78.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 10:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/14/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB72B**	QC Batch:	99417 -125
Sample #:	**368639**	Anal. Batch:	221766
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	6.3

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	3.01
72-55-9	4,4'-DDE	20 U	20	3.64
50-29-3	4,4'-DDT	20 U	20	3.39
309-00-2	Aldrin	20 U	20	2.84
319-84-6	Alpha-BHC	20 U	20	3.18
5103-71-9	A-Chlordane	20 U	20	2.83
5103-74-2	G-Chlordane	20 U	20	2.88
319-85-7	Beta-BHC	20 U	20	3.95
319-86-8	Delta-BHC	20 U	20	2.45
60-57-1	Dieldrin	20 U	20	2.97
959-98-8	Endosulfan I	20 U	20	3.30
33213-65-9	Endosulfan II	20 U	20	1.98
1031-07-8	Endosulfan Sulfate	20 U	20	3.38
72-20-8	Endrin	20 U	20	3.15
7421-93-4	Endrin Aldehyde	20 U	20	2.73
53494-70-5	Endrin Ketone	20 U	20	2.88
58-89-9	Lindane	20 U	20	3.30
76-44-8	Heptachlor	20 U	20	3.10
1024-57-3	Heptachlor Epoxide	20 U	20	4.36
72-43-5	Methoxychlor	20 U	20	5.88
8001-35-2	Toxaphene	320 U	320	86.3

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 10:35
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/14/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB72C**	QC Batch:	99417 -125
Sample #:	**368640**	Anal. Batch:	221766
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.87
72-55-9	4,4'-DDE	20 U	20	3.46
50-29-3	4,4'-DDT	20 U	20	3.23
309-00-2	Aldrin	20 U	20	2.70
319-84-6	Alpha-BHC	20 U	20	3.03
5103-71-9	A-Chlordane	20 U	20	2.69
5103-74-2	G-Chlordane	20 U	20	2.74
319-85-7	Beta-BHC	20 U	20	3.76
319-86-8	Delta-BHC	20 U	20	2.33
60-57-1	Dieldrin	20 U	20	2.83
959-98-8	Endosulfan I	20 U	20	3.14
33213-65-9	Endosulfan II	20 U	20	1.89
1031-07-8	Endosulfan Sulfate	20 U	20	3.22
72-20-8	Endrin	20 U	20	3.00
7421-93-4	Endrin Aldehyde	20 U	20	2.60
53494-70-5	Endrin Ketone	20 U	20	2.74
58-89-9	Lindane	20 U	20	3.14
76-44-8	Heptachlor	20 U	20	2.95
1024-57-3	Heptachlor Epoxide	20 U	20	4.15
72-43-5	Methoxychlor	20 U	20	5.60
8001-35-2	Toxaphene	320 U	320	82.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 10:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/14/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB75A**	QC Batch:	99417 -125
Sample #:	**368641**	Anal. Batch:	221766
Matrix:	Soil	Percent Solids:	89
Unit:	ug/kg dry	Dilution Factor:	5.6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.68
72-55-9	4,4'-DDE	20 U	20	3.23
50-29-3	4,4'-DDT	20 U	20	3.01
309-00-2	Aldrin	20 U	20	2.52
319-84-6	Alpha-BHC	20 U	20	2.83
5103-71-9	A-Chlordane	20 U	20	2.51
5103-74-2	G-Chlordane	20 U	20	2.56
319-85-7	Beta-BHC	20 U	20	3.51
319-86-8	Delta-BHC	20 U	20	2.18
60-57-1	Dieldrin	20 U	20	2.64
959-98-8	Endosulfan I	20 U	20	2.93
33213-65-9	Endosulfan II	20 U	20	1.76
1031-07-8	Endosulfan Sulfate	20 U	20	3.01
72-20-8	Endrin	20 U	20	2.80
7421-93-4	Endrin Aldehyde	20 U	20	2.43
53494-70-5	Endrin Ketone	20 U	20	2.56
58-89-9	Lindane	20 U	20	2.93
76-44-8	Heptachlor	20 U	20	2.76
1024-57-3	Heptachlor Epoxide	20 U	20	3.88
72-43-5	Methoxychlor	20 U	20	5.22
8001-35-2	Toxaphene	320 U	320	76.7

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 11:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB75B**	QC Batch:	99417 -125
Sample #:	**368642**	Anal. Batch:	221766
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	5.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.77
72-55-9	4,4'-DDE	20 U	20	3.35
50-29-3	4,4'-DDT	20 U	20	3.12
309-00-2	Aldrin	20 U	20	2.61
319-84-6	Alpha-BHC	20 U	20	2.93
5103-71-9	A-Chlordane	20 U	20	2.60
5103-74-2	G-Chlordane	20 U	20	2.65
319-85-7	Beta-BHC	20 U	20	3.64
319-86-8	Delta-BHC	20 U	20	2.26
60-57-1	Dieldrin	20 U	20	2.73
959-98-8	Endosulfan I	20 U	20	3.04
33213-65-9	Endosulfan II	20 U	20	1.83
1031-07-8	Endosulfan Sulfate	20 U	20	3.11
72-20-8	Endrin	20 U	20	2.90
7421-93-4	Endrin Aldehyde	20 U	20	2.52
53494-70-5	Endrin Ketone	20 U	20	2.65
58-89-9	Lindane	20 U	20	3.04
76-44-8	Heptachlor	20 U	20	2.85
1024-57-3	Heptachlor Epoxide	20 U	20	4.01
72-43-5	Methoxychlor	20 U	20	5.41
8001-35-2	Toxaphene	320 U	320	79.5

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 11:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB75C**	QC Batch:	99417 -125
Sample #:	**368643**	Anal. Batch:	221766
Matrix:	Soil	Percent Solids:	91
Unit:	ug/kg dry	Dilution Factor:	5.5

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.63
72-55-9	4,4'-DDE	20 U	20	3.17
50-29-3	4,4'-DDT	20 U	20	2.96
309-00-2	Aldrin	20 U	20	2.48
319-84-6	Alpha-BHC	20 U	20	2.78
5103-71-9	A-Chlordane	20 U	20	2.47
5103-74-2	G-Chlordane	20 U	20	2.51
319-85-7	Beta-BHC	20 U	20	3.45
319-86-8	Delta-BHC	20 U	20	2.14
60-57-1	Dieldrin	20 U	20	2.59
959-98-8	Endosulfan I	20 U	20	2.88
33213-65-9	Endosulfan II	20 U	20	1.73
1031-07-8	Endosulfan Sulfate	20 U	20	2.95
72-20-8	Endrin	20 U	20	2.75
7421-93-4	Endrin Aldehyde	20 U	20	2.39
53494-70-5	Endrin Ketone	20 U	20	2.51
58-89-9	Lindane	20 U	20	2.88
76-44-8	Heptachlor	20 U	20	2.71
1024-57-3	Heptachlor Epoxide	20 U	20	3.81
72-43-5	Methoxychlor	20 U	20	5.13
8001-35-2	Toxaphene	320 U	320	75.4

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 14:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB76C**	QC Batch:	99417 -125
Sample #:	**368644**	Anal. Batch:	221766
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	5.9

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.82
72-55-9	4,4'-DDE	20 U	20	3.40
50-29-3	4,4'-DDT	20 U	20	3.17
309-00-2	Aldrin	20 U	20	2.66
319-84-6	Alpha-BHC	20 U	20	2.98
5103-71-9	A-Chlordane	20 U	20	2.65
5103-74-2	G-Chlordane	20 U	20	2.70
319-85-7	Beta-BHC	20 U	20	3.70
319-86-8	Delta-BHC	20 U	20	2.30
60-57-1	Dieldrin	20 U	20	2.78
959-98-8	Endosulfan I	20 U	20	3.09
33213-65-9	Endosulfan II	20 U	20	1.86
1031-07-8	Endosulfan Sulfate	20 U	20	3.17
72-20-8	Endrin	20 U	20	2.95
7421-93-4	**Endrin Aldehyde**	**4.2 J**	20	2.56
53494-70-5	Endrin Ketone	20 U	20	2.70
58-89-9	Lindane	20 U	20	3.09
76-44-8	Heptachlor	20 U	20	2.90
1024-57-3	Heptachlor Epoxide	20 U	20	4.08
72-43-5	Methoxychlor	20 U	20	5.50
8001-35-2	Toxaphene	320 U	320	80.8

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB73A**	QC Batch:	99417 -125
Sample #:	**368645**	Anal. Batch:	221766
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U		20	2.87
72-55-9	4,4'-DDE	20 U		20	3.46
50-29-3	4,4'-DDT	20 U		20	3.23
309-00-2	Aldrin	20 U		20	2.70
319-84-6	Alpha-BHC	20 U		20	3.03
5103-71-9	A-Chlordane	20 U		20	2.69
5103-74-2	G-Chlordane	20 U		20	2.74
319-85-7	Beta-BHC	20 U		20	3.76
319-86-8	Delta-BHC	20 U		20	2.33
60-57-1	Dieldrin	20 U		20	2.83
959-98-8	Endosulfan I	20 U		20	3.14
33213-65-9	Endosulfan II	20 U		20	1.89
1031-07-8	Endosulfan Sulfate	20 U		20	3.22
72-20-8	Endrin	20 U		20	3.00
7421-93-4	**Endrin Aldehyde**	**4.4 J**	J,g	20	2.60
53494-70-5	Endrin Ketone	20 U		20	2.74
58-89-9	Lindane	20 U		20	3.14
76-44-8	Heptachlor	20 U		20	2.95
1024-57-3	Heptachlor Epoxide	20 U		20	4.15
72-43-5	Methoxychlor	20 U		20	5.60
8001-35-2	Toxaphene	320 U		320	82.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 15:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB73B**	QC Batch:	99417 -125
Sample #:	**368646**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U		20	2.72
72-55-9	4,4'-DDE	20 U		20	3.29
50-29-3	4,4'-DDT	20 U		20	3.07
309-00-2	Aldrin	20 U		20	2.57
319-84-6	Alpha-BHC	20 U		20	2.88
5103-71-9	A-Chlordane	20 U		20	2.56
5103-74-2	G-Chlordane	20 U		20	2.60
319-85-7	Beta-BHC	20 U		20	3.57
319-86-8	Delta-BHC	20 U		20	2.22
60-57-1	Dieldrin	20 U		20	2.68
959-98-8	Endosulfan I	20 U		20	2.99
33213-65-9	Endosulfan II	20 U		20	1.80
1031-07-8	Endosulfan Sulfate	20 U		20	3.06
72-20-8	Endrin	20 U		20	2.85
7421-93-4	Endrin Aldehyde	~~20 U~~	5.6J	20	2.47
53494-70-5	Endrin Ketone	20 U		20	2.60
58-89-9	Lindane	20 U		20	2.99
76-44-8	Heptachlor	20 U		20	2.80
1024-57-3	Heptachlor Epoxide	20 U		20	3.94
72-43-5	Methoxychlor	20 U		20	5.32
8001-35-2	Toxaphene	320 U		320	78.1

Lab Flag

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 15:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/22/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB73C**	QC Batch:	98680 -128
Sample #:	**368647**	Anal. Batch:	221995
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	5.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.77
72-55-9	4,4'-DDE	20 U	20	3.35
50-29-3	4,4'-DDT	20 U	20	3.12
309-00-2	Aldrin	20 U	20	2.61
319-84-6	Alpha-BHC	20 U	20	2.93
5103-71-9	A-Chlordane	20 U	20	2.60
5103-74-2	G-Chlordane	20 U	20	2.65
319-85-7	Beta-BHC	20 U	20	3.64
319-86-8	Delta-BHC	20 U	20	2.26
60-57-1	Dieldrin	20 U	20	2.73
959-98-8	Endosulfan I	20 U	20	3.04
33213-65-9	Endosulfan II	20 U	20	1.83
1031-07-8	Endosulfan Sulfate	20 U	20	3.11
72-20-8	Endrin	20 U	20	2.90
7421-93-4	Endrin Aldehyde	20 U	20	2.52
53494-70-5	Endrin Ketone	20 U	20	2.65
58-89-9	Lindane	20 U	20	3.04
76-44-8	Heptachlor	20 U	20	2.85
1024-57-3	Heptachlor Epoxide	20 U	20	4.01
72-43-5	Methoxychlor	20 U	20	5.41
8001-35-2	Toxaphene	320 U	320	79.5

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 15:45
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB74A**	QC Batch:	98680 -128
Sample #:	**368648**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.72
72-55-9	4,4'-DDE	20 U	20	3.29
50-29-3	4,4'-DDT	20 U	20	3.07
309-00-2	Aldrin	20 U	20	2.57
319-84-6	Alpha-BHC	20 U	20	2.88
5103-71-9	A-Chlordane	20 U	20	2.56
5103-74-2	G-Chlordane	20 U	20	2.60
319-85-7	Beta-BHC	20 U	20	3.57
319-86-8	Delta-BHC	20 U	20	2.22
60-57-1	Dieldrin	20 U	20	2.68
959-98-8	Endosulfan I	20 U	20	2.99
33213-65-9	Endosulfan II	20 U	20	1.80
1031-07-8	Endosulfan Sulfate	20 U	20	3.06
72-20-8	Endrin	20 U	20	2.85
7421-93-4	Endrin Aldehyde	20 U	20	2.47
53494-70-5	Endrin Ketone	20 U	20	2.60
58-89-9	Lindane	20 U	20	2.99
76-44-8	Heptachlor	20 U	20	2.80
1024-57-3	Heptachlor Epoxide	20 U	20	3.94
72-43-5	Methoxychlor	20 U	20	5.32
8001-35-2	Toxaphene	320 U	320	78.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 15:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB74B**	QC Batch:	98680 -128
Sample #:	**368649**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	6.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	3.25
72-55-9	4,4'-DDE	20 U	20	3.92
50-29-3	4,4'-DDT	20 U	20	3.66
309-00-2	Aldrin	20 U	20	3.06
319-84-6	Alpha-BHC	20 U	20	3.43
5103-71-9	A-Chlordane	20 U	20	3.05
5103-74-2	G-Chlordane	20 U	20	3.11
319-85-7	Beta-BHC	20 U	20	4.26
319-86-8	Delta-BHC	20 U	20	2.65
60-57-1	Dieldrin	20 U	20	3.20
959-98-8	Endosulfan I	20 U	20	3.56
33213-65-9	Endosulfan II	20 U	20	2.14
1031-07-8	Endosulfan Sulfate	20 U	20	3.65
72-20-8	Endrin	20 U	20	3.40
7421-93-4	Endrin Aldehyde	20 U	20	2.95
53494-70-5	Endrin Ketone	20 U	20	3.11
58-89-9	Lindane	20 U	20	3.56
76-44-8	Heptachlor	20 U	20	3.35
1024-57-3	Heptachlor Epoxide	20 U	20	4.71
72-43-5	Methoxychlor	20 U	20	6.34
8001-35-2	Toxaphene	320 U	320	93.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 16:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB74C**	QC Batch:	98680 -128
Sample #:	**368650**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	6.3

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	3.01
72-55-9	4,4'-DDE	20 U	20	3.64
50-29-3	4,4'-DDT	20 U	20	3.39
309-00-2	Aldrin	20 U	20	2.84
319-84-6	Alpha-BHC	20 U	20	3.18
5103-71-9	A-Chlordane	20 U	20	2.83
5103-74-2	G-Chlordane	20 U	20	2.88
319-85-7	Beta-BHC	20 U	20	3.95
319-86-8	Delta-BHC	20 U	20	2.45
60-57-1	Dieldrin	20 U	20	2.97
959-98-8	Endosulfan I	20 U	20	3.30
33213-65-9	Endosulfan II	20 U	20	1.98
1031-07-8	Endosulfan Sulfate	20 U	20	3.38
72-20-8	Endrin	20 U	20	3.15
7421-93-4	Endrin Aldehyde	20 U	20	2.73
53494-70-5	Endrin Ketone	20 U	20	2.88
58-89-9	Lindane	20 U	20	3.30
76-44-8	Heptachlor	20 U	20	3.10
1024-57-3	Heptachlor Epoxide	20 U	20	4.36
72-43-5	Methoxychlor	20 U	20	5.88
8001-35-2	Toxaphene	320 U	320	86.3

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 17:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB71A**	QC Batch:	98680 -128
Sample #:	**368651**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	6.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	3.25
72-55-9	4,4'-DDE	20 U	20	3.92
50-29-3	4,4'-DDT	20 U	20	3.66
309-00-2	Aldrin	20 U	20	3.06
319-84-6	Alpha-BHC	20 U	20	3.43
5103-71-9	A-Chlordane	20 U	20	3.05
5103-74-2	G-Chlordane	20 U	20	3.11
319-85-7	Beta-BHC	20 U	20	4.26
319-86-8	Delta-BHC	20 U	20	2.65
60-57-1	Dieldrin	20 U	20	3.20
959-98-8	Endosulfan I	20 U	20	3.56
33213-65-9	Endosulfan II	20 U	20	2.14
1031-07-8	Endosulfan Sulfate	20 U	20	3.65
72-20-8	Endrin	20 U	20	3.40
7421-93-4	Endrin Aldehyde	20 U	20	2.95
53494-70-5	Endrin Ketone	20 U	20	3.11
58-89-9	Lindane	20 U	20	3.56
76-44-8	Heptachlor	20 U	20	3.35
1024-57-3	Heptachlor Epoxide	20 U	20	4.71
72-43-5	Methoxychlor	20 U	20	6.34
8001-35-2	Toxaphene	320 U	320	93.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 17:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB71B**	QC Batch:	98680 -128
Sample #:	**368652**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	6.8

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	3.25
72-55-9	4,4'-DDE	20 U	20	3.92
50-29-3	4,4'-DDT	20 U	20	3.66
309-00-2	Aldrin	20 U	20	3.06
319-84-6	Alpha-BHC	20 U	20	3.43
5103-71-9	A-Chlordane	20 U	20	3.05
5103-74-2	G-Chlordane	20 U	20	3.11
319-85-7	Beta-BHC	20 U	20	4.26
319-86-8	Delta-BHC	20 U	20	2.65
60-57-1	Dieldrin	20 U	20	3.20
959-98-8	Endosulfan I	20 U	20	3.56
33213-65-9	Endosulfan II	20 U	20	2.14
1031-07-8	Endosulfan Sulfate	20 U	20	3.65
72-20-8	Endrin	20 U	20	3.40
7421-93-4	Endrin Aldehyde	20 U	20	2.95
53494-70-5	Endrin Ketone	20 U	20	3.11
58-89-9	Lindane	20 U	20	3.56
76-44-8	Heptachlor	20 U	20	3.35
1024-57-3	Heptachlor Epoxide	20 U	20	4.71
72-43-5	Methoxychlor	20 U	20	6.34
8001-35-2	Toxaphene	320 U	320	93.2

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 17:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**54SB71C**	QC Batch:	98680 -128
Sample #:	**368653**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	70
Unit:	ug/kg dry	Dilution Factor:	7.1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	3.39
72-55-9	4,4'-DDE	20 U	20	4.10
50-29-3	4,4'-DDT	20 U	20	3.82
309-00-2	Aldrin	20 U	20	3.20
319-84-6	Alpha-BHC	20 U	20	3.59
5103-71-9	A-Chlordane	20 U	20	3.19
5103-74-2	G-Chlordane	20 U	20	3.24
319-85-7	Beta-BHC	20 U	20	4.45
319-86-8	Delta-BHC	20 U	20	2.76
60-57-1	Dieldrin	20 U	20	3.34
959-98-8	Endosulfan I	20 U	20	3.72
33213-65-9	Endosulfan II	20 U	20	2.24
1031-07-8	Endosulfan Sulfate	20 U	20	3.81
72-20-8	Endrin	20 U	20	3.55
7421-93-4	Endrin Aldehyde	20 U	20	3.08
53494-70-5	Endrin Ketone	20 U	20	3.24
58-89-9	Lindane	20 U	20	3.72
76-44-8	Heptachlor	20 U	20	3.49
1024-57-3	Heptachlor Epoxide	20 U	20	4.91
72-43-5	Methoxychlor	20 U	20	6.62
8001-35-2	Toxaphene	320 U	320	97.3

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/15/04 by MSN
	RFAAP SWMU 54	Anal. Method:	USEPA-8081A
Sample ID:	**DUP-8**	QC Batch:	98680 -128
Sample #:	**368654**	Anal. Batch:	221767
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	5.7

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	20 U	20	2.72
72-55-9	4,4'-DDE	20 U	20	3.29
50-29-3	4,4'-DDT	20 U	20	3.07
309-00-2	Aldrin	20 U	20	2.57
319-84-6	Alpha-BHC	20 U	20	2.88
5103-71-9	A-Chlordane	20 U	20	2.56
5103-74-2	G-Chlordane	20 U	20	2.60
319-85-7	Beta-BHC	20 U	20	3.57
319-86-8	Delta-BHC	20 U	20	2.22
60-57-1	Dieldrin	20 U	20	2.68
959-98-8	Endosulfan I	20 U	20	2.99
33213-65-9	Endosulfan II	20 U	20	1.80
1031-07-8	Endosulfan Sulfate	20 U	20	3.06
72-20-8	Endrin	20 U	20	2.85
7421-93-4	Endrin Aldehyde	20 U	20	2.47
53494-70-5	Endrin Ketone	20 U	20	2.60
58-89-9	Lindane	20 U	20	2.99
76-44-8	Heptachlor	20 U	20	2.80
1024-57-3	Heptachlor Epoxide	20 U	20	3.94
72-43-5	Methoxychlor	20 U	20	5.32
8001-35-2	Toxaphene	320 U	320	78.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**DUP-7**	QC Batch:	98865 -125
Sample #:	**368637**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	**PCB-1254**	**12 J**	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 10:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/03/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB72A**	QC Batch:	98865 -125
Sample #:	**368638**	Anal. Batch:	221101
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result		Reporting Limit	MDL
12674-11-2	PCB-1016	66 U		66	8.91
11104-28-2	PCB-1221	66 U		66	10.3
11141-16-5	PCB-1232	66 U		66	9.13
53469-21-9	PCB-1242	33 U		33	6.16
12672-29-6	PCB-1248	33 U		33	5.83
11097-69-1	**PCB-1254**	**19 J**	J,C	33	7.48
11096-82-5	PCB-1260	66 U		66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 10:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB72B**	QC Batch:	98865 -125
Sample #:	**368639**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	10.5
11104-28-2	PCB-1221	66 U	66	12.2
11141-16-5	PCB-1232	66 U	66	10.8
53469-21-9	PCB-1242	33 U	33	7.28
12672-29-6	PCB-1248	33 U	33	6.89
11097-69-1	PCB-1254	33 U	33	8.84
11096-82-5	PCB-1260	66 U	66	13.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 10:35
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB72C**	QC Batch:	98865 -125
Sample #:	**368640**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 10:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB75A**	QC Batch:	98865 -125
Sample #:	**368641**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	89
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 11:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB75B**	QC Batch:	98865 -125
Sample #:	**368642**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 11:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB75C**	QC Batch:	98865 -125
Sample #:	**368643**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	91
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 14:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB76C**	QC Batch:	98865 -125
Sample #:	**368644**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	85
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 15:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB73A**	QC Batch:	98865 -125
Sample #:	**368645**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 15:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/25/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB73B**	QC Batch:	98865 -125
Sample #:	**368646**	Anal. Batch:	221100
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.10
11104-28-2	PCB-1221	66 U	66	9.40
11141-16-5	PCB-1232	66 U	66	8.30
53469-21-9	PCB-1242	33 U	33	5.60
12672-29-6	PCB-1248	33 U	33	5.30
11097-69-1	PCB-1254	33 U	33	6.80
11096-82-5	PCB-1260	66 U	66	10.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 15:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB73C**	QC Batch:	98571 -128
Sample #:	**368647**	Anal. Batch:	220947
Matrix:	Soil	Percent Solids:	86
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	9.72
11104-28-2	PCB-1221	66 U	66	11.3
11141-16-5	PCB-1232	66 U	66	9.96
53469-21-9	PCB-1242	33 U	33	6.72
12672-29-6	PCB-1248	33 U	33	6.36
11097-69-1	PCB-1254	33 U	33	8.16
11096-82-5	PCB-1260	66 U	66	12.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 15:45
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004 RFAAP SWMU 54	Analyzed:	09/01/04 by JLRM
		Anal. Method:	USEPA-8082
Sample ID:	**54SB74A**	QC Batch:	98571 -128
Sample #:	**368648**	Anal. Batch:	220947
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 15:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB74B**	QC Batch:	98571 -128
Sample #:	**368649**	Anal. Batch:	220947
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	11.3
11104-28-2	PCB-1221	66 U	66	13.2
11141-16-5	PCB-1232	66 U	66	11.6
53469-21-9	PCB-1242	33 U	33	7.84
12672-29-6	PCB-1248	33 U	33	7.42
11097-69-1	PCB-1254	33 U	33	9.52
11096-82-5	PCB-1260	66 U	66	14.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 16:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/01/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB74C**	QC Batch:	98571 -128
Sample #:	**368650**	Anal. Batch:	220947
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	10.5
11104-28-2	PCB-1221	66 U	66	12.2
11141-16-5	PCB-1232	66 U	66	10.8
53469-21-9	PCB-1242	33 U	33	7.28
12672-29-6	PCB-1248	33 U	33	6.89
11097-69-1	PCB-1254	33 U	33	8.84
11096-82-5	PCB-1260	66 U	66	13.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 17:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB71A**	QC Batch:	98571 -128
Sample #:	**368651**	Anal. Batch:	220947
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	11.3
11104-28-2	PCB-1221	66 U	66	13.2
11141-16-5	PCB-1232	66 U	66	11.6
53469-21-9	PCB-1242	33 U	33	7.84
12672-29-6	PCB-1248	33 U	33	7.42
11097-69-1	**PCB-1254**	**15 J** JC	33	9.52
11096-82-5	PCB-1260	66 U	66	14.1

000642

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 17:15
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB71B**	QC Batch:	98571 -128
Sample #:	**368652**	Anal. Batch:	220947
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	11.3
11104-28-2	PCB-1221	66 U	66	13.2
11141-16-5	PCB-1232	66 U	66	11.6
53469-21-9	PCB-1242	33 U	33	7.84
12672-29-6	PCB-1248	33 U	33	7.42
11097-69-1	PCB-1254	33 U	33	9.52
11096-82-5	PCB-1260	66 U	66	14.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 17:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**54SB71C**	QC Batch:	98571 -128
Sample #:	**368653**	Anal. Batch:	220947
Matrix:	Soil	Percent Solids:	70
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	11.3
11104-28-2	PCB-1221	66 U	66	13.2
11141-16-5	PCB-1232	66 U	66	11.6
53469-21-9	PCB-1242	33 U	33	7.84
12672-29-6	PCB-1248	33 U	33	7.42
11097-69-1	PCB-1254	33 U	33	9.52
11096-82-5	PCB-1260	66 U	66	14.1

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	08/20/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	08/21/04 @ 09:10
		Prepared:	08/28/04 by PAK
Submittal #:	**36440-21**	Prep. Method:	USEPA-3550B
Submittal:	Soil, Aug 20, 2004	Analyzed:	09/02/04 by JLRM
	RFAAP SWMU 54	Anal. Method:	USEPA-8082
Sample ID:	**DUP-8**	QC Batch:	98571 -128
Sample #:	**368654**	Anal. Batch:	220947
Matrix:	Soil	Percent Solids:	87
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polychlorinated Biphenyls	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	66 U	66	8.91
11104-28-2	PCB-1221	66 U	66	10.3
11141-16-5	PCB-1232	66 U	66	9.13
53469-21-9	PCB-1242	33 U	33	6.16
12672-29-6	PCB-1248	33 U	33	5.83
11097-69-1	PCB-1254	33 U	33	7.48
11096-82-5	PCB-1260	66 U	66	11.1

End of Analytical Report

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 00:00
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **DUP-7**
Sample #: **368637**
Matrix: Soil

Percent Solids: 85

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	85	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001404

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 10:15
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB72A**
Sample #: **368638**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	87	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001405

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 10:25
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB72B**
Sample #: **368639**
Matrix: Soil

Percent Solids: 79

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	79	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001406

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 10:35
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB72C**
Sample #: **368640**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	83	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001407

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 10:50
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB75A**
Sample #: **368641**
Matrix: Soil

Percent Solids: 89

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	89	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001408

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 11:00
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB75B**
Sample #: **368642**
Matrix: Soil

Percent Solids: 86

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	86	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001409

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 11:10
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB75C**
Sample #: **368643**
Matrix: Soil

Percent Solids: 91

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	91	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001410

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 14:40
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB76C**
Sample #: **368644**
Matrix: Soil

Percent Solids: 85

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	85	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001411

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 15:00
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB73A**
Sample #: **368645**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	83	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001412

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 15:10
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB73B**
Sample #: **368646**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	87	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001413

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 15:15
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB73C**
Sample #: **368647**
Matrix: Soil

Percent Solids: 86

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	86	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001414

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 15:45
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB74A**
Sample #: **368648**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	87	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 15:50
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB74B**
Sample #: **368649**
Matrix: Soil

Percent Solids: 73

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	73	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001416

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 16:00
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB74C**
Sample #: **368650**
Matrix: Soil

Percent Solids: 79

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	79	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001417

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 17:10
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB71A**
Sample #: **368651**
Matrix: Soil

Percent Solids: 74

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	74	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001418

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 17:15
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB71B**
Sample #: **368652**
Matrix: Soil

Percent Solids: 74

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	74	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001419

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Individual sample results relate only to the sample tested.
5560 Corporate Exchange Court SE • Grand Rapids, MI 49512 • (616) 975-4500 • Fax (616) 942-7463

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 17:20
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **54SB71C**
Sample #: **368653**
Matrix: Soil

Percent Solids: 70

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	70	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001420

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 08/20/04 @ 00:00
Sampler: D. Copen
Received: 08/21/04 @ 09:10

Submittal #: **36440-21**
Submittal: Soil, Aug 20, 2004
RFAAP SWMU 54
Sample ID: **DUP-8**
Sample #: **368654**
Matrix: Soil

Percent Solids: 87

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	87	0.1	0.1	%	09/02/04	TAM	SW-846 3550B

001421

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DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: Andrea Sansom
Date: November 22, 2004
DV Level: II III IV
Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-21
Test Name: PEST/PCB
Method No.: 8081A/8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Do any soil samples contain more than 50% water?	X		
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		X	

Notes: *One cooler at 3.2C. (TM0640)*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	X		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	X		

Notes: *EQB-4 was non-detect*

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	X		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	X		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		Pest	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows? If No, the associated sample result should be carefully evaluated.	X		

Notes:

5.0 GC/ECD Instrument Performance Check for Pesticides		Yes	No	NA
5.1	Is the 4,4'-DDT breakdown </= to 15%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	X		
5.2	Is the endrin breakdown </= to 15%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	X		

Notes:

6.0 Surrogate Recovery					Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?				X		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.				X		
6.3	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?				X		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?						X
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)						X
	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance			
	1 out	high/low	No action	No action			
	2 out	2 high same column	K	No action			
		2 low same column	L, UL	No action			
		mixed same column	J, UJ	No action			
		2 high diff columns	J	Not applicable			
		2 low diff columns	J, UJ	Not applicable			
		mixed diff columns	Professional judgement	Not applicable			
	3 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		2 high, 1 low	K (2 high)	J (1 low 2nd column)			
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)			
		other mixed	J, UJ	Not applicable			
	4 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		Mixed	J, UJ	Not applicable			
	If any recovery is >0% and <10% then L(+)/R(-).						
	If any recovery is 0% then R(+/-).						

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 30-150%?		X	
7.4	Are there any RPDs outside the QC limits not to exceed 60%?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 54SB73C MS MSD RPD

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	X		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 30-150%?		X	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			X
	If Yes, J(+) only.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54SB76C and DUP-7*
54SB74A and DUP-8

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).		X	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	X		

Notes:

11.0 Pesticide Cleanup Checks		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes: *CLP requirement, not provided*

Case narrative indicates mercury was used to remove sulfur due to the possibility of degradation of some pesticide target analytes with use of the recommended cleanup with activated copper.

12.0 Data Completeness				Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	Pest	PCB	X		
	Number of samples:	18	18			
	Number of target compounds in each analysis:	21	7			
	Number of results rejected and not reported:	0	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)					
	% Completeness =	100%	100%			

Notes:

Radford Army Ammunition Plant
Chain of Custody Record

pg 1 of 2 — 005 — COC ED by WR — Cart 5 TM0640

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

00014

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SA CODE	MATRIX CODE	TEST GROUP	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
DUP-7	8.20.04	—	5	X		1	M	U	1				X	X											FD	SO	46	368037
545B72A		1015	5	X		1	M	U	1				X	X											N	SO	46	368038
545B72B		1025	5	X		1	M	U	1				X	X											N	SO	46	368039
545B72C		1035	5	X		1	M	U	1				X	X											N	SO	46	368040
545B75A		1050	5	X		1	M	U	1				X	X											N	SO	46	368041
545B75B		1100	5	X		1	M	U	1				X	X											N	SO	46	368042
545B75C		1110	5	X		1	M	U	1				X	X											N	SO	46	368043
545B76C		1440	5	X		1	M	U	1				X	X											N	SO	46	368044
545B73A		1500	5	X		1	M	U	1				X	X											N	SO	46	368045
545B73B		1510	5	X		1	M	U	1				X	X											N	SO	46	368046
545B73C MS MSD		1515	5	X		1	M	U	3				X	X											N	SO	46	368047
545B74A		1545	5	X		1	M	U	1				X	X											N	SO	46	368048
545B74B		1550	5	X		1	M	U	1				X	X											N	SO	46	368049
545B74C	✓	1600	5	X		1	M	U	1				X	X											N	SO	46	368050

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by: David Copen — Date/time 8.20.04 1945
2. Relinquished by: — Date/Time

1. Received by: Tari Pelton — Date/time 8/21/04 9:10
2. Received by: — Date/Time

Additional Comments: 36440-2 1

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(1)

Radford Army Ammunition Plant
Chain of Custody Record

pg. 2 of 2 006 coc ID by WR Cart 5 TM0640

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000015

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Cozen & John Spangler

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	SC Code	MATRIX CODE	TEST CODE	Lab Sample ID
545B71A	8-2004	1710	5	X		1	M	U	1				X	X										N1	50	46	368651
545B71B	↓	1715	5	X		1	M	U	1				X	X										N1	50	46	368652
545B71C	↓	1720	5	X		1	M	U	1				X	X										N1	50	46	368653
DUP-8	8-20-04	—	5	X		W	W	U	1																		368654

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
Lab Sample ID

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time
David Cozen	8.20.04 1945		
1. Received by:	**Date/time**	**2. Received by:**	**Date/Time**
Lori Plaskon	8/21/04 9:10		

Additional Comments:
36440-2

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

(2)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army | Receipt Record Page/Line No.: 41-3 | Project-Submittal No.: (new) / add to 36440-21 | Project Chemist: CWR | Sample Nos.:

Coolers Received

Recorded by (initials/date): LKP 8/21/04 | ☑ Cooler ☐ Box ☐ Other | Qty Received: 5 | ☑ IR Gun (#94) | Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (#____) | ☐ See Additional Cooler Information Form

Cooler No.	Time	Custody Seals	Coolant Location	Coolant/Temperature Taken Via	Alternate Temperature Taken Via	Recorded °C	Correction Factor °C	Actual °C
#1	10:50	☑ none ☐ present / intact ☐ present / not intact	Dispersed / Top / (Middle) / Bottom	☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container	tb 11.3	0	11.3
						tb location: (representative) / in ice		
						1 12.6	0	12.6
						2 11.8	0	11.8
						3 14.9	0	14.9
							Average °C	13.1
						☑ Cooler ID on COC?		
						☐ VOC trip blank received?		
TM0739	10:55	☑ none ☐ present / intact ☐ present / not intact	Dispersed / (Top) / Middle / Bottom	☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container	tb 8.9	0	8.9
						tb location: (representative) / in ice		
						1 7.9	0	7.9
						2 8.3	0	8.3
						3 7.8	0	7.8
							Average °C	8.0
						☑ Cooler ID on COC?		
						☐ VOC trip blank received?		
TM0884	11:10	☑ none ☐ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container	tb 4.5	0	4.5
						tb location: representative / (in ice)		
						1 4.3	0	4.3
						2 3.2	0	3.2
						3 4.6	0	4.6
							Average °C	4.0
						☑ Cooler ID on COC?		
						☐ VOC trip blank received?		
TM0912	11:25	☑ none ☐ present / intact ☐ present / not intact	Dispersed / Top / (Middle) / Bottom	☐ loose ice / avg 2-3 containers ☑ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container	tb 14.6	0	14.6
						tb location: (representative) / in ice		
						1 13.7	0	13.7
						2 14.2	0	14.2
						3 15.0	0	15.0
							Average °C	14.3
						☑ Cooler ID on COC?		
						☐ VOC trip blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by _____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other _____

COC ID Nos.

☐ TriMatrix

☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☐	Sample ID matches COC?
☐	☐	Sample date and time matches COC?
☐		Container type completed on COC?
☑	☐	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
		☐	Broken containers/lids?
		☑	Missing or incomplete labels?
		☑	Illegible information on labels?
		☑	Low volume received?
		☐	Inappropriate containers received?
☑		☐	VOC vials have headspace?
☑		☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☐	☑	All sample temperatures ≤4° C?
☑	☐		Completed Sample Preservation Verification Form?
☑	☐		Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged IL Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

This version of checklist applies to COCs 0054006.

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) _____
☐ No analysis requested, Proj. Chemist completed (init./date) _____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
8/21/04 9:10	8/21/04 11:50	Yes (No)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST
ADDITIONAL COOLER INFORMATION

Recorded by (initials/date)	Client	Project-Submittal No.
LKP 8/21/04	Radford Army	36440-21
	Receipt Log No. 41-3 Sample Nos.	Project Chemist WDR

Cooler No. TM0640 Time 11:35

Custody Seals
- ☐ none
- ☑ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☑ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☑ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	3.2	0	3.2
tb location: representative / in ice			
1	1.9	0	1.9
2	4.7	0	4.7
3	2.9	0	2.9
		Average °C	3.2

- ☑ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Comments

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-22 **Fraction:** Manganese

Lab: TriMatrix **Project Name:** Radford_SWMU_54

Reviewer: Andrea_Sansom **Date:** December_2,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: The instrument initial and/or continuing calibration blanks displayed negative estimate detections less than the reporting limit. The positive associated field sample result was greater than five times the absolute value of the blank detection and and no data qualifying action was required. The associated non-detect field sample results were flagged "UL,o".

Correctable Anomalies: None.

Comments: The cooler was received by the laboratory at a temperature less than the lower control limit of 2.0°C at 0.5°C. Since the containers were received intact and aliquots were not frozen, no impact to data quality was anticipated and no data qualifying action was taken. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SWMU54
36440-22

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
373340	54MW-1	10/11/2004	Total and Dissolved Manganese
373341	54MW-6	10/11/2004	Total and Dissolved Manganese
373342	MWEB1	10/11/2004	Total Manganese

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/04 @ 12:40
Project:	Richmond, VA	Sampler:	J. Spangler
	RFAAP	Received:	10/14/04 @ 08:40
Submittal #:	**36440-22**		
Submittal:	GW October 11, 2004		
	RFAAP SWMU 54		
Sample ID:	**54MW-1**		
Sample #:	**373340**		
Matrix:	Ground Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	10 U	UL,o 10	1.64	ug/L	10/29/04	KLVM	EPA-200.7/6010B
Manganese, Dissolved	10 U	UL,o 10	1.64	ug/L	10/29/04	KLVM	EPA-200.7/6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/04 @ 17:20
Project:	Richmond, VA	Sampler:	J. Spangler
	RFAAP	Received:	10/14/04 @ 08:40

Submittal #: **36440-22**
Submittal: GW October 11, 2004
RFAAP SWMU 54
Sample ID: **54MW-6**
Sample #: **373341**
Matrix: Ground Water Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	22	10	1.64	ug/L	10/29/04	KLVM	EPA-200.7/6010B
Manganese, Dissolved	10 U	10	1.64	ug/L	10/29/04	KLVM	EPA-200.7/6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/04 @ 16:15
Project:	Richmond, VA	Sampler:	J. Spangler
	RFAAP	Received:	10/14/04 @ 08:40
Submittal #:	**36440-22**		
Submittal:	GW October 11, 2004		
	RFAAP SWMU 54		
Sample ID:	**MWEB1**		
Sample #:	**373342**		
Matrix:	QC Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	10 U	UL,0 10	1.64	ug/L	10/29/04	KLVM	EPA-200.7/6010B

End of Analytical Report

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DATA VALIDATION WORKSHEET
INORGANIC - ICP/ICPMS/CVAA
REGION III - NATIONAL FUNCTIONAL GUIDELINES

Project Name: Radford SWMU54
Reviewer: Andrea Sansom
Date: 12/2/2004

SDG No.: 36440-22
Project No.: 21355035.20001

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?				x					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?				x					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?					x				
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)				x					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.				x					

Note:

Coolers at 0.5C

2.0 Holding Time		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).					x				

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".				4+BLK					
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).				x					
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".				x					
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based				x					
3.5	Were ICV/CCV reported from mutiple exposures (3 for ICP or 2 for CVAA) with passing %RSD (ICP < 5% or CVAA < 10%)? If no, contact project chemist for laboratory resolution.				x					
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP: 90%-110% & Hg: 80-120%				x					
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%									
3.7	For one point curves on ICP & ICPMS, did the CRDL standard recover between 80-120%? <50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						x			

Note: _____

4.0 Blanks

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?				x					
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".				x					
4.3	Are there reported MB or ICB/CCBs values > MDL?					x				
	Sample Results > MDL									
	< 5X Blank Contamination B									
4.4	Are there negative blank results with the absolute value > MDL?				x					
	Sample Results Non-detects > MDL									
	< 5X absolute Blank Contamination UL L									
4.5	Are there reported field blank > ± MDL?					x				
	Sample Results > MDL									
	< 5X Blank Contamination B									

Note: _____

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?				x					
5.2	Are the ICS AB recoveries within 80% - 120%?				x					
5.3	Are the results for unspiked analytes (in ICS A) < ± MDL?					x				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?					x				
	If not...									
	Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)									
	< -IDL > IDL < 50% 50% - 79% >120%									
	L(+)/UL(-) K(+) L(+)/R(-) L(+)/UL(-) K(+)									

Note: _____

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.				X					
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)					X				

Action:	Solid		Aqueous		
	< LCL	> UCL	< 50%	50% - 79%	> 120%
	L(+)/UL(-)	K(+)	L(+)/R(-)	L(+)/UL(-)	K(+)

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.				X					
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.									
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.				X					

Note: *54MW-6*

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.				x					
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?									
					x					
	Positive: %R > 125% = K; 30%< %R < 74% = L; < 30% = L									
	Non-detect: None; UL; R									
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.				x					

Note: *54MW6 - MS/MSD/RPD/PDS - passed*

9.0 Instrument Detection Limits (IDL)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?				x					

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?				x					
10.2	Was a five-fold dilution performed?				x					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).					x				

Note:

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?				x					
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.									
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report				x					

Note: _____

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?				x					
12.2	Were all dilutions reflected in the positive results and detection limits?						x			
12.3	Were the Internal Standard recoveries within 30-120% (6020) or 80-120% (6010B)?				x					
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?									
12.5	Were the tune mass calibrations < 0.1 amu from the true value?									
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?									

Note: _____

13.0 Completeness Calculation		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)				x					
13.1.1	Number of samples: 2									
13.1.2	Number of target compounds in each analysis: 5									
13.1.3	Number of results rejected and not reported: 0									
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%									

Note: _____

Radford Army Ammunition Plant
Chain of Custody Record

COC 007 — Cart 4 — TM1018

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000015

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers:

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	Manganese	Diss. Manganese	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW-1	10-11-04	12:40			✓	9	R	U	1																1		Lab assigned ID
54MW-1	10-11-04	12:40			✓	9	RW	F	1																	1	37338-10
54MW-6	10-11-04	17:20			✓	9	R	U	1																1		
54MW-6	10-11-04	17:20			✓	9	RW	F	1																	1	37338-11
MW6B1	10-11-04	1615			✓	9	R	U	1																1		37338-12
Temp Blank																											

Box #1: 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other GW

Box #2: Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3: F. Filtered; U. Unfiltered

Box #4: R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date time	2. Relinquished by:	Date Time	Additional Comments:
	10/12/04, 745			36440-22
1. Received by:	Date time	2. Received by:	Date Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
	10/14/04 840			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

31-6

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army | Project-Submittal No.: new / add to 36440-22
Receipt Record Page/Line No.: 31-6 | Project Chemist: CWR | Sample Nos.:

Coolers Received

Recorded by (initials/date): LKP 10/14/04

☑ Cooler ☐ Box ☐ Other ____ | Qty Received: 1

☑ IR Gun (#94) | Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (# ____) | ☐ See Additional Cooler Information Form

Cooler No. TM1018 | Time 9:25

Custody Seals
- ☐ none
- ☑ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / (Top) / Middle / Bottom

Coolant/Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☑ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☑ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	0.5	0	0.5
tb location: representative / in ice			
1	0.8	0	0.8
2	1.6	0	1.6
3	2.9	0	2.9
		Average °C	1.8

☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No. ____ | Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No. ____ | Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No. ____ | Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

☐ Cooler ID on COC? ☐ VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos.

☐ TriMatrix

☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☐	Sample ID matches COC?
☑	☐	Sample date and time matches COC?
☑		Container type completed on COC?
☑	☐	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
	☐	☑	Broken containers/lids?
	☐	☑	Missing or incomplete labels?
	☐	☐	Illegible information on labels?
	☐	☑	Low volume received?
	☐	☑	Inappropriate containers received?
☑	☐	☐	VOC vials have headspace?
☐	☐	☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☑	☐	All sample temperatures ≤4° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☑		Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

- ☐ Bacteriological
- ☐ Air Bags
- ☐ EnCores
- ☐ Formaldehyde/Aldehyde
- ☐ Green-tagged Containers
- ☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
- ☐ NONE RECEIVED
- ☐ RECEIVED, COCs TO LAB(S)

Notes

- ☐ Trip blank received ☐ Trip blank not listed on COC
- ☐ No COC received, Proj. Chemist reviewed (init./date) ____
- ☐ No analysis requested, Proj. Chemist completed (init./date)

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
10/14/04 8:40	10/14/04 9:40	(Yes) / No

000018

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-23 **Fraction:** Manganese

Lab: TriMatrix **Project Name:** Radford_SWMU_54

Reviewer: Andrea_Sansom **Date:** January_11,_2005

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: The cooler was received by the laboratory at a temperature less than the lower control limit of 2.0°C at 0.6°C. Since the containers were received intact and aliquots were not frozen, no impact to data quality was anticipated and no data qualifying action was taken. All data are usable for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SWMU54
36440-22

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
377579	54MW-1	11/30/2004	Total and Dissolved Manganese
377580	EQB-1	11/30/2004	Total Manganese
377581	54MW-6	11/30/2004	Total and Dissolved Manganese

TriMatrix
Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	11/30/04 @ 12:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/01/04 @ 09:20
Submittal #:	**36440-23**		
Submittal:	GW November 30, 2004		
	RFAAP SWMU 54		
Sample ID:	**54MW-1**		
Sample #:	**377579**		
Matrix:	Ground Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	10 U	10	1.68	ug/L	12/09/04	JMF	EPA-200.7/6010B
Manganese, Dissolved	10 U	10	1.68	ug/L	12/09/04	JMF	EPA-200.7/6010B

000027

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	11/30/04 @ 13:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/01/04 @ 09:20
Submittal #:	**36440-23**		
Submittal:	GW November 30, 2004		
	RFAAP SWMU 54		
Sample ID:	**EQB-1**		
Sample #:	**377580**		
Matrix:	QC Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	10 U	10	1.68	ug/L	12/09/04	JMF	EPA-200.7/6010B

000028

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	11/30/04 @ 13:25
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/01/04 @ 09:20
Submittal #:	**36440-23**		
Submittal:	GW November 30, 2004		
	RFAAP SWMU 54		
Sample ID:	**54MW-6**		
Sample #:	**377581**		
Matrix:	Ground Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	3.38 J	10	1.68	ug/L	12/09/04	JMF	EPA-200.7/6010B
Manganese, Dissolved	10 U	10	1.68	ug/L	12/09/04	JMF	EPA-200.7/6010B

End of Analytical Report

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DATA VALIDATION WORKSHEET
INORGANIC - ICP/ICPMS/CVAA
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-23
Project No.: 21355035.20001

Project Name: Radford SWMU54
Reviewer: Andrea Sansom
Date: 1/11/2005

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?				x					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?				x					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?					x				
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)				x					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.				x					

Note:

Cooler at 0.6C

2.0 Holding Time		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).					x				

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".				4+BLK					
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).				x					
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".				x					
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based				x					
3.5	Were ICV/CCV reported from mutiple exposures (3 for ICP or 2 for CVAA) with passing %RSD (ICP < 5% or CVAA < 10%)? If no, contact project chemist for laboratory resolution.				x					
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP: 90%-110% & Hg: 80-120%				x					
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%									
3.7	For one point curves on ICP & ICPMS, did the CRDL standard recover between 80-120%? <50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K						x			

Note: _____

4.0 Blanks

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?				x					
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".				x					
4.3	Are there reported MB or ICB/CCBs values > MDL?					x				
	Sample Results > MDL									
	< 5X Blank Contamination B									
4.4	Are there negative blank results with the absolute value > MDL?					x				
	Sample Results Non-detects > MDL									
	< 5X absolute Blank Contamination UL L									
4.5	Are there reported field blank > ± MDL?					x				
	Sample Results > MDL									
	< 5X Blank Contamination B									

Note: _____

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?				x					
5.2	Are the ICS AB recoveries within 80% - 120%?				x					
5.3	Are the results for unspiked analytes (in ICS A) < ± MDL?					x				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?					x				
	If not...									
	Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)									
	< -IDL > IDL < 50% 50% - 79% >120%									
	L(+)/UL(-) K(+) L(+)/R(-) L(+)/UL(-) K(+)									

Note: _____

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.				x					
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)					x				

Action:	Solid		Aqueous		
	< LCL	> UCL	< 50%	50% - 79%	> 120%
	L(+)/UL(-)	K(+)	L(+)/R(-)	L(+)/UL(-)	K(+)

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.				x					
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.									
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.				x					

Note: *LCSD*

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.						x			
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?									
	%R > 125% / 30%< %R < 74% / < 30%									
	Positive: K / L / L						x			
	Non-detect: None / UL / R									
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.				x					

Note: _____

9.0 Instrument Detection Limits (IDL)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?				x					

Note: _____

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?				x					
10.2	Was a five-fold dilution performed?				x					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).				x					

Note: _____

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?						x			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.									
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report						x			

Note: _____

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?						x			
12.2	Were all dilutions reflected in the positive results and detection limits?						x			
12.3	Were the Internal Standard recoveries within 30-120% (6020) or 80-120% (6010B)?				x					
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?									
12.5	Were the tune mass calibrations < 0.1 amu from the true value?									
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?									

Note: _____

13.0 Completeness Calculation		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)				x					
13.1.1	Number of samples: 3									
13.1.2	Number of target compounds in each analysis: 5 total									
13.1.3	Number of results rejected and not reported: 0									
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%									

Note: _____

Radford Army Ammunition Plant
Chain of Custody Record

COC #008 (WK)

Cart 4
TM0892

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000015

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	Mn (manganese)	SA COE	MATRIX COE	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW1	11.30.04	1200	S		X	9	R	U	1															X	N1	SG	377579
↓	↓	↓	S		X	9	RW	F	1															X	—	—	—
EQB-1	11.30.04	1300	S		X	5	R	U	1															X	EB1	SG	377580
54MW6	11.30.04	1325	S		X	9	R	U	1															X	N1	SG	377581
↓	↓	↓	S		X	9	RW	F	1															X	—	—	—

Lab assigned to
TG 47 — 20 47 —

Box #1 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other GW

Box #2 Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by: David Copen — Date time: 11.30.04 1850
2. Relinquished by: — Date Time:

1. Received by: — Date time: 12/1/04 9:20
2. Received by: — Date Time:

Additional Comments: 36440-23

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

11-11

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: Radford Army | Project-Submittal No.: (new) / add to 36440-23
Receipt Record Page/Line No.: 11-11 | Project Chemist: WSR | Sample Nos.:

Coolers Received

Recorded by (initials/date): LMP 12/1/04

☑ Cooler ☐ Box ☐ Other ____ | Qty Received: 1

☑ IR Gun (#94) | Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (#____) | ☐ See Additional Cooler Information Form

Cooler No.	Time	Recorded °C	Correction Factor °C	Actual °C
JM0892	11:25			
tb		0.6	0	0.6
1		0.7	0	0.7
2		0.8	0	0.8
3		1.3	0	1.3
Average °C				0.9

Custody Seals: ☑ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant/Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container
tb location: representative / in ice
☑ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time	Recorded °C	Correction Factor °C	Actual °C
tb				
1				
2				
3				
Average °C				

Custody Seals: ☐ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container
tb location: representative / in ice
☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time	Recorded °C	Correction Factor °C	Actual °C
tb				
1				
2				
3				
Average °C				

Custody Seals: ☐ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container
tb location: representative / in ice
☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time	Recorded °C	Correction Factor °C	Actual °C
tb				
1				
2				
3				
Average °C				

Custody Seals: ☐ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ☐ none / avg 2-3 containers
Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container
tb location: representative / in ice
☐ Cooler ID on COC? ☐ VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos.

☐ TriMatrix

☑ Other (name or ID#) Radford

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☐	Sample ID matches COC?
☑	☐	Sample date and time matches COC?
☑		Container type completed on COC?
☑	☐	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
	☐	☑	Broken containers/lids?
	☐	☑	Missing or incomplete labels?
	☐	☑	Illegible information on labels?
	☐	☑	Low volume received?
	☐	☑	Inappropriate containers received?
☑	☐		VOC vials have headspace?
☑	☐		Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☑	☐	All sample temperatures ≤4° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☑		Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
12/1/04 9:20	12/1/04 11:35	Yes / (No)

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-24 **Fraction:** Manganese

Lab: TriMatrix **Project Name:** Radford_SWMU_54

Reviewer: Andrea_Sansom **Date:** February_7,_2005

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: The laboratory blanks displayed the following negative detections:

Blank Type (listed in order of analysis)	Concentration (µg/L)
Initial Calibration Blank	-1.9
Continuing Calibration Blank 1	-1.9
Method Prep Blank	-1.7
Continuing Calibration Blank 2	-1.8

The positive associated field sample result was flagged "L,o" while the non-detects were flagged "UL,o".

Correctable Anomalies: None.

Comments: The cooler was received by the laboratory at a temperature less than the lower control limit of 2.0°C at 0.7°C. Since the containers were received intact and aliquots were not frozen, no impact to data quality was anticipated and no data qualifying action was taken. All data are usable as qualified for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SWMU54
36440-24

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
379252	54MW-1	12/15/2004	Total and Dissolved Manganese
379253	EQB-1	12/15/2004	Total Manganese
379254	54MW-6	12/15/2004	Total and Dissolved Manganese

TriMatrix
Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/15/04 @ 12:50
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/16/04 @ 09:00
Submittal #:	**36440-24**		
Submittal:	GW December 15, 2004		
	RFAAP SWMU 54		
Sample ID:	**54MW-1**		
Sample #:	**379252**		
Matrix:	Ground Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	10 U	UL,0 10	1.68	ug/L	01/08/05	KLVM	EPA-200.7/6010B
Manganese, Dissolved	10 U	UL,0 10	1.68	ug/L	01/08/05	KLVM	EPA-200.7/6010B

000027

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/15/04 @ 13:05
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/16/04 @ 09:00
Submittal #:	**36440-24**		
Submittal:	GW December 15, 2004		
	RFAAP SWMU 54		
Sample ID:	**EQB-1**		
Sample #:	**379253**		
Matrix:	Ground Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	10 U	VL 10	1.68	ug/L	01/08/05	KLVM	EPA-200.7/6010B

000028

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TriMatrix
Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/15/04 @ 14:40
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/16/04 @ 09:00
Submittal #:	**36440-24**		
Submittal:	GW December 15, 2004		
	RFAAP SWMU 54		
Sample ID:	**54MW-6**		
Sample #:	**379254**		
Matrix:	Ground Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	2 J	L,o 10	1.68	ug/L	01/08/05	KLVM	EPA-200.7/6010B
Manganese, Dissolved	10 U	UL,o 10	1.68	ug/L	01/08/05	KLVM	EPA-200.7/6010B

End of Analytical Report

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DATA VALIDATION WORKSHEET
INORGANIC - ICP/ICPMS/CVAA
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-24
Project No.: 21355035.20001

Project Name: Radford SWMU54
Reviewer: Andrea Sansom
Date: 2/7/2005

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?				X					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?				X					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?					X				
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)				X					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.				X					

Note:

Cooler at 0.7C

2.0 Holding Time		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).					X				

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".				4+BLK					
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).				X					
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".				X					
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based				X					
3.5	Were ICV/CCV reported from mutiple exposures (3 for ICP or 2 for CVAA) with passing %RSD (ICP < 5% or CVAA < 10%)? If no, contact project chemist for laboratory resolution.				X					
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP: 90%-110% & Hg: 80-120%				X					
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%									
3.7	For one point curves on ICP & ICPMS, did the CRDL standard recover between 80-120%?						X			
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K									

Note: _____

4.0 Blanks

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?				X					
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".				X					
4.3	Are there reported MB or ICB/CCBs values > MDL?					X				
	Sample Results > MDL									
	< 5X Blank Contamination B									
4.4	Are there negative blank results with the absolute value > MDL?					X				
	Sample Results Non-detects > MDL									
	< 5X absolute Blank Contamination UL L									
4.5	Are there reported field blank > ± MDL?					X				
	Sample Results > MDL									
	< 5X Blank Contamination B									

Note: _____

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?				X					
5.2	Are the ICS AB recoveries within 80% - 120%?				X					
5.3	Are the results for unspiked analytes (in ICS A) < ± MDL?				X					
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?						X			
	If not...									
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)									

Note: _____

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.				X					
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)					X				

Action:	Solid		Aqueous		
	< LCL	> UCL	< 50%	50% - 79%	> 120%
	L(+)/UL(-)	K(+)	L(+)/R(-)	L(+)/UL(-)	K(+)

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.				X					
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.									
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.				X					

Note: ***LCSD***

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.						X			
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?									
	%R > 125% / 30%< %R < 74% / < 30%						X			
	Positive: K / L / L									
	Non-detect: None / UL / R									
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.									

Note: _____

9.0 Instrument Detection Limits (IDL)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?				X					

Note: _____

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?						X			
10.2	Was a five-fold dilution performed?									
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).									

Note: _____

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?						X			
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.									
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report						X			

Note: _____

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?						X			
12.2	Were all dilutions reflected in the positive results and detection limits?						X			
12.3	Were the Internal Standard recoveries within 30-120% (6020) or 80-120% (6010B)?				X					
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?									
12.5	Were the tune mass calibrations < 0.1 amu from the true value?									
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?									

Note: _____

13.0 Completeness Calculation		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)				X					
13.1.1	Number of samples: 3									
13.1.2	Number of target compounds in each analysis: 5 total									
13.1.3	Number of results rejected and not reported: 0									
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%									

Note: _____

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client	Project-Submittal No.
Radford Army	(new) add to 36440-24
Receipt Record Page/Line No. 39-8	Project Chemist WAR / Sample Nos.

Coolers Received

Recorded by (initials/date): LKP 12/16/04

☑ Cooler ☐ Box ☐ Other ____ | Qty Received: 1

☑ IR Gun (#94) | Thermometer Used ☐ Digital Thermometer (#54) ☐ Other (# ____) | ☐ See Additional Cooler Information Form

Cooler No. TM0842 | Time 10:00

Custody Seals
- ☐ none
- ☑ present / intact
- ☐ present / not intact

Coolant Location: (Dispersed) / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☑ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1	0.9	0	0.9
2	0.2	0	0.2
3	1.0	0	1.0
		Average °C	0.7

- ☑ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ | Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ | Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. ____ | Time ____

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	**Chain of Custody Record(s)?**
	☐		If **No**, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☐	☐		Other ____

COC ID Nos. 009 (TriMatrix-assigned)

- ☐ TriMatrix
- ☑ Other (name or ID#) Radford Army

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	☐	Sample ID matches COC?
☑	☐	Sample date and time matches COC?
☑		Container type completed on COC?
☑	☐	All container types indicated are received?

Sample Condition Summary

☐ **Non-TriMatrix containers, see Notes**

N/A	Yes	No	
	☐	☑	Broken containers/lids?
	☐	☑	Missing or incomplete labels?
	☐	☑	Illegible information on labels?
	☐	☑	Low volume received?
	☐	☑	Inappropriate containers received?
☑	☐	☐	VOC vials have headspace?
☑	☐	☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☑	☐	All sample temperatures ≤4° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☑	☐	Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

- ☐ Bacteriological
- ☐ Air Bags
- ☐ EnCores
- ☐ Formaldehyde/Aldehyde
- ☐ Green-tagged Containers
- ☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
- ☐ NONE RECEIVED
- ☐ RECEIVED, COCs TO LAB(S)

Notes

- ☐ Trip blank received ☐ Trip blank not listed on COC
- ☐ No COC received, Proj. Chemist reviewed (init./date) ____
- ☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
12/16/04 9:00	12/16/04 10:10	Yes / (No)

Radford Army Ammunition Plant
Chain of Custody Record

COC# 089

Cart 2

TM0842

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000015

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & Brett Fisher

Lab Contact:
Walt Roudebush
616.975.4561

AIRBILL No:

Courier:
Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	Manganese	SAC code	Matrix code	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations) Lab Sample ID
54MW1	12 15 04	1250	S		X	9	R	U	1															X	N1	WG	379252
↓	↓	↓	S		X	9	RW	F	1															X	—		—
EQB-1	12 15 04	1305	S		X	5	R	U	1															X	EB	SB	379253
54MW6	12 15 04	1440	S		X	9	R	U	1															X	N1	WG	379254
↓	↓	↓	S		X	9	RW	F	1															X	—		—

TG 47 1 20 47 1

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other GW

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by:	Date time	2. Relinquished by:	Date Time	Additional Comments:
David Copen	12 15 04 1625			36440-24
1. Received by:	Date time	2. Received by:	Date Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Joe Baker	12/16/04 9:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

39-8

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-25 **Fraction:** Explosives, Nitroglycerin, & Manganese

Lab: TriMatrix **Project Name:** Radford_SWMU_54

Reviewer: Andrea_Sansom **Date:** February_7,_2005

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: For the explosives analyses, the relative percent difference between the dual column concentrations exceeded the method recommended control limit of 40% for hexahydro-1,2,3-trinitro-1,3,5-triazine results for samples 54MW – 8 at 481.1% and 54MW – 9 at 841.8%. Due to the possibility of carryover or positive interference, the lower of the two concentrations were reported. These results were flagged "J,g". The concentration exceeded the linear range of the initial calibration for 2,4,6-trinitrotoluene in the straight analyses for samples 54MW – 10 and DUP – 1. These results were flagged "J,q". Both samples were reanalyzed at a dilution factor of two with acceptable results for 2,4,6-trinitrotoluene that should be used for data interpretation.

Correctable Anomalies: None.

Comments: For the nitroglycerin analyses, all field samples were non-detect on the analytical columns CN and C18. The positive interference present on the C8 column from 2,4,6-trinitrotoluene was of no consequence. The chain of custody #COC 010 indicated 54MW-9 whereas the sample containers within this cooler indicated 54MW-8 on the labels. As directed by the field sampler, the laboratory used the identification from the sample container label for log-in purposes. If a given fraction was not discussed, all quality control criteria was met for that fraction. All data are usable as qualified for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SWMU54
36440-25

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
380005	54MW-8	12/15/2004	Total and Dissolved Manganese, Explosives, & Nitroglycerin
380006	54MW-10	12/15/2004	Total and Dissolved Manganese, Explosives, & Nitroglycerin
380007	54MW-9	12/15/2004	Total and Dissolved Manganese, Explosives, & Nitroglycerin
380008	DUP-1	12/15/2004	Total and Dissolved Manganese, Explosives, & Nitroglycerin

Radford Army Ammunitions Plant
SWMU54
Duplicate Statistics

54MW-10 and DUP-1

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	2xRL	Pass /Fail
Explosives									
1,3,5-trinitrobenzene	µg/L	0.65	3.3	12	12	**0.0%**	0.0	1.3	Pass
2,4,6-trinitrotoluene	µg/L	0.65	3.3	62	65	**4.7%**	3.0	1.3	Pass
2-amino-4,6-dinitrotoluene	µg/L	1.0	5.0	5.6	5.8	**3.5%**	0.20	2.0	Pass
octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	µg/L	1.0	5.0	6.8	7.2	**5.7%**	0.40	2.0	Pass
hexahydro-1,3,5-trinitro-1,3,5-triazine	µg/L	0.65	3.3	28	29	**3.5%**	1.0	1.3	Pass
Manganese									
Manganese, total	µg/L	10	50	190	191	**0.5%**	1.0	20	Pass
Manganese, dissolved	µg/L	10	50	190	180	**5.4%**	10	20	Pass

Aqueous Control Limits

[sample] > 5 x RL, use 25%
[sample] < 5 x RL, use 2 x RL

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 14:35
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25
		Prepared:	12/23/04 by ASC
Submittal #:	**36440-25**	Prep. Method:	USEPA-8330
Submittal:	GW December 12, 2004	Analyzed:	01/03/05 by JAFY
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54MW-8**	QC Batch:	103050 -123
Sample #:	**380005**	Anal. Batch:	227310
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	HMX **Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**3.0**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	RDX ***Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**0.20 J** J,q	0.65	0.164
479-45-8	Tetryl Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

* See attached Statement of Data Qualifications.

000142

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 16:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25
		Prepared:	12/23/04 by ASC
Submittal #:	**36440-25**	Prep. Method:	USEPA-8330
Submittal:	GW December 12, 2004	Analyzed:	01/03/05 by JAFY
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54MW-10**	QC Batch:	103050 -123
Sample #:	**380006**	Anal. Batch:	227310
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	**1,3,5-Trinitrobenzene**	**12**	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
~~118-96-7~~	~~**2,4,6-Trinitrotoluene**~~	~~**64 E**~~ 5.9	~~0.65~~	~~0.0749~~
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**5.6**	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**6.8**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**28**	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

see dilution 1/27/05

* See attached Statement of Data Qualifications.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 16:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25
		Prepared:	12/23/04 by ASC
Submittal #:	**36440-25**	Prep. Method:	USEPA-8330
Submittal:	GW December 12, 2004	Analyzed:	01/03/05 by JAFY
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**54MW-10**	QC Batch:	103050 -123
Sample #:	**380006DL**	Anal. Batch:	227310
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	2

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	**1,3,5-Trinitrobenzene**	**11**	1.3	0.316
99-65-0	1,3-Dinitrobenzene	2.0 U	2.0	0.460
118-96-7	**2,4,6-Trinitrotoluene**	**62**	1.3	0.150
121-14-2	2,4-Dinitrotoluene	1.3 U	1.3	0.244
606-20-2	2,6-Dinitrotoluene	2.0 U	2.0	0.534
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**5.1**	2.0	0.400
88-72-2	2-Nitrotoluene	2.0 U	2.0	0.526
99-08-1	3-Nitrotoluene	4.0 U	4.0	0.436
1946-51-0	4-Amino-2,6-dinitro-toluene	2.0 U	2.0	0.628
99-99-0	4-Nitrotoluene	4.0 U	4.0	0.292
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**6.7**	2.0	0.500
98-95-3	Nitrobenzene	1.3 U	1.3	0.116
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**27**	1.3	0.328
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	4.0 U	4.0	0.360

* Use only 2,4,6 TNT from this dilution 2/7/05

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 13:20
Project:	Richmond, VA RFAAP	Sampler:	D. Copen
		Received:	12/22/04 @ 10:25
		Prepared:	12/23/04 by ASC
Submittal #:	**36440-25**	Prep. Method:	USEPA-8330
Submittal:	GW December 12, 2004 RFAAP SWMU 54	Analyzed:	01/03/05 by JAFY
		Anal. Method:	USEPA-8330
Sample ID:	**54MW-9**	QC Batch:	103050 -123
Sample #:	**380007**	Anal. Batch:	227310
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.0749
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**3.4**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	***Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**1.1** J,g	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25
		Prepared:	12/23/04 by ASC
Submittal #:	**36440-25**	Prep. Method:	USEPA-8330
Submittal:	GW December 12, 2004	Analyzed:	01/03/05 by JAFY
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**DUP-1**	QC Batch:	103050 -123
Sample #:	**380008**	Anal. Batch:	227310
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	**1,3,5-Trinitrobenzene**	**12**	0.65	0.158
99-65-0	1,3-Dinitrobenzene	1.0 U	1.0	0.230
~~118-96-7~~	~~*2,4,6-Trinitrotoluene~~	~~66 E~~	~~0.65~~	~~0.0749~~
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.122
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.267
35572-78-2	**2-Amino-4,6-dinitro-toluene**	**5.8**	1.0	0.200
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.263
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.218
1946-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.314
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.146
2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**7.2**	1.0	0.250
98-95-3	Nitrobenzene	0.65 U	0.65	0.0579
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**29**	0.65	0.164
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.180

5,9 V

see dilution 1/27/05

* See attached Statement of Data Qualifications.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25
		Prepared:	12/23/04 by ASC
Submittal #:	**36440-25**	Prep. Method:	USEPA-8330
Submittal:	GW December 12, 2004	Analyzed:	01/03/05 by JAFY
	RFAAP SWMU 54	Anal. Method:	USEPA-8330
Sample ID:	**DUP-1**	QC Batch:	103050 -123
Sample #:	**380008DL**	Anal. Batch:	227310
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	2

	CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
	99-35-4	**1,3,5-Trinitrobenzene**	**12**	1.3	0.316
	99-65-0	1,3-Dinitrobenzene	2.0 U	2.0	0.460
★	118-96-7	**2,4,6-Trinitrotoluene**	**65**	1.3	0.150
	121-14-2	2,4-Dinitrotoluene	1.3 U	1.3	0.244
	606-20-2	2,6-Dinitrotoluene	2.0 U	2.0	0.534
	35572-78-2	**2-Amino-4,6-dinitro-toluene**	**5.3**	2.0	0.400
	88-72-2	2-Nitrotoluene	2.0 U	2.0	0.526
	99-08-1	3-Nitrotoluene	4.0 U	4.0	0.436
	1946-51-0	4-Amino-2,6-dinitro-toluene	2.0 U	2.0	0.628
	99-99-0	4-Nitrotoluene	4.0 U	4.0	0.292
	2691-41-0	**Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine**	**7.2**	2.0	0.500
	98-95-3	Nitrobenzene	1.3 U	1.3	0.116
	121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**27**	1.3	0.328
	479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	4.0 U	4.0	0.360

★ Use only 2,4,6 TNT from this dilution. ab 2/7/05

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 14:35
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25
		Prepared:	12/28/04 by ASC
Submittal #:	**36440-25**	Prep. Method:	USEPA-8332
Submittal:	GW December 12, 2004	Analyzed:	01/06/05 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54MW-8**	QC Batch:	103016 -128
Sample #:	**380005**	Anal. Batch:	227261
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 16:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25
		Prepared:	12/28/04 by ASC
Submittal #:	**36440-25**	Prep. Method:	USEPA-8332
Submittal:	GW December 12, 2004	Analyzed:	01/06/05 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54MW-10**	QC Batch:	103016 -128
Sample #:	**380006**	Anal. Batch:	227261
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000316

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 13:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25
		Prepared:	12/28/04 by ASC
Submittal #:	**36440-25**	Prep. Method:	USEPA-8332
Submittal:	GW December 12, 2004	Analyzed:	01/06/05 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**54MW-9**	QC Batch:	103016 -128
Sample #:	**380007**	Anal. Batch:	227261
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

000317

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 00:00
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25
		Prepared:	12/28/04 by ASC
Submittal #:	**36440-25**	Prep. Method:	USEPA-8332
Submittal:	GW December 12, 2004	Analyzed:	01/06/05 by JMK1
	RFAAP SWMU 54	Anal. Method:	USEPA-8332
Sample ID:	**DUP-1**	QC Batch:	103016 -128
Sample #:	**380008**	Anal. Batch:	227261
Matrix:	Ground Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
55-63-0	Nitroglycerin	5.0 U	5.0	0.590

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 14:35
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25

Submittal #: **36440-25**
Submittal: GW December 12, 2004
RFAAP SWMU 54
Sample ID: **54MW-8**
Sample #: **380005**
Matrix: Ground Water Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	20	10	1.68	ug/L	01/17/05	DWJ	EPA-200.7/6010B
Manganese, Dissolved	20	10	1.68	ug/L	01/17/05	DWJ	EPA-200.7/6010B

000040

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 16:10
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25
Submittal #:	**36440-25**		
Submittal:	GW December 12, 2004		
	RFAAP SWMU 54		
Sample ID:	**54MW-10**		
Sample #:	**380006**		
Matrix:	Ground Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	190	10	1.68	ug/L	01/17/05	DWJ	EPA-200.7/6010B
Manganese, Dissolved	190	10	1.68	ug/L	01/17/05	DWJ	EPA-200.7/6010B

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	12/21/04 @ 13:20
Project:	Richmond, VA	Sampler:	D. Copen
	RFAAP	Received:	12/22/04 @ 10:25

Submittal #: **36440-25**
Submittal: GW December 12, 2004
RFAAP SWMU 54
Sample ID: **54MW-9**
Sample #: **380007**
Matrix: Ground Water Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	65	10	1.68	ug/L	01/17/05	DWJ	EPA-200.7/6010B
Manganese, Dissolved	63	10	1.68	ug/L	01/17/05	DWJ	EPA-200.7/6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RFAAP

Sampled: 12/21/04 @ 00:00
Sampler: D. Copen
Received: 12/22/04 @ 10:25

Submittal #: **36440-25**
Submittal: GW December 12, 2004
RFAAP SWMU 54
Sample ID: **DUP-1**
Sample #: **380008**
Matrix: Ground Water

Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Manganese, Total	191	10	1.68	ug/L	01/17/05	DWJ	EPA-200.7/6010B
Manganese, Dissolved	180	10	1.68	ug/L	01/17/05	DWJ	EPA-200.7/6010B

000043

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DATA VALIDATION WORKSHEET

Explosives

Reviewer: Andrea Sansom
Date: 2/7/2005
DV Level: II III IV

Review Document:

_X_ Region III Modified for National Functional Guidelines
___ NFG for organic Data review (February 1994)
_X_ Project QAPP/SAP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-25
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids (for		X	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: *The chain of custody (54MW-9 COC010) and the sample container labels (54MW-8) had a different identification. As directed by the field sampler, the laboratory used the identification from the sample container label for log-in purposes.*

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: *Three coolers at 2.8C, 2.7C and 3.9C.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			X

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?		X	
6.4	Are there any RPD for MS/MSD recoveries outside the QC limits not to exceed 60%?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: *54MW-8*

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			X
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: *54MW- 10 and DUP-1*

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	X		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.	X		
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		X		
	Number of samples:	4			
	Number of target compounds in each analysis:	14			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET

Nitroglycerin

Reviewer: Andrea Sansom
Date: 2/7/2005
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Project Name: Radford SWMU54
Project Number: 21355035.20001
Laboratory: TriMatrix
SDG No.: 36440-25
Test Name: Nitroglycerin
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids (for		X	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes: *The chain of custody (54MW-9 COC010) and the sample container labels (54MW-8) had a different identification. As directed by the field sampler, the laboratory used the identification from the sample container label for log-in purposes.*

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".	X		
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes: *Three coolers at 2.8C, 2.7C and 3.9C.*

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.			X

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X	X	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: *54MW - 8*

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?			X
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: ***54MW - XX and DUP-5***

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 4			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP/ICPMS/CVAA
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-25
Project No.: 21355035.20001

Project Name: Radford SWMU54
Reviewer: Andrea Sansom
Date: 2/7/2005

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?				X					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?				X					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?					X				
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)				X					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.				X					

Note:

Three coolers at 2.8C, 2.7C and 3.9C.

2.0 Holding Time		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).					X				

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".				4+BLK					
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).				X					
3.3	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".				X					
3.4	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based				X					
3.5	Were ICV/CCV reported from mutiple exposures (3 for ICP or 2 for CVAA) with passing %RSD (ICP < 5% or CVAA < 10%)? If no, contact project chemist for laboratory resolution.				X					
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP: 90%-110% & Hg: 80-120%				X					
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%									
3.7	For one point curves on ICP & ICPMS, did the CRDL standard recover between 80-120%?						X			
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K									

Note: ***Evaluation of the CCBs and MB was performed down to the MDL for both positive and negative detections.***

4.0 Blanks

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?				X					
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".				X					
4.3	Are there reported MB or ICB/CCBs values > MDL?					X				
	Sample Results > MDL									
	< 5X Blank Contamination B									
4.4	Are there negative blank results with the absolute value > MDL?					X				
	Sample Results Non-detects > MDL									
	< 5X absolute Blank Contamination UL L									
4.5	Are there reported field blank > ± MDL?						X			
	Sample Results > MDL									
	< 5X Blank Contamination B									

Note:

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?				X					
5.2	Are the ICS AB recoveries within 80% - 120%?				X					
5.3	Are the results for unspiked analytes (in ICS A) < ± MDL?					X				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?						X			
	If not...									
	Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)									
	< -IDL > IDL < 50% 50% - 79% >120%									
	L(+)/UL(-) K(+) L(+)/R(-) L(+)/UL(-) K(+)									

Note:

6.0 Laboratory Control Sample (LCS)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.				X					
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)					X				
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)									

Note:

7.0 Laboratory Duplicates (MSD)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.				X					
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.									
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.				X					

Note: ***54MW - 8***

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.				X					
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?				X					
	%R > 125% 30%< %R < 74% < 30%									
	Positive K L L									
	Non-detect None UL R									
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.				X					

Note: _____

9.0 Instrument Detection Limits (IDL)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?				X					

Note: _____

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?				X					
10.2	Was a five-fold dilution performed?				X					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).					X				

Note: _____

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?				X					
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.									
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report				X					

Note: ***54MW - 10 and DUP-1***

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?				X					
12.2	Were all dilutions reflected in the positive results and detection limits?						X			
12.3	Were the Internal Standard recoveries within 30-120% (6020) or 80-120% (6010B)?				X					
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?									
12.5	Were the tune mass calibrations < 0.1 amu from the true value?									
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?									

Note:

13.0 Completeness Calculation		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)				X					
13.1.1	Number of samples: 4									
13.1.2	Number of target compounds in each analysis: 2									
13.1.3	Number of results rejected and not reported: 0									
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%									

Note:

Radford Army Ammunition Plant
Chain of Custody Record

COC# 010 (WR)

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

000019

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & Darren Renne

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	Manganese	S & COE	Matrix Code	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
* 54MW-9	12.21.04	1435	S		X	9	M	U	4						(4)												38
	↓	↓	S		X	9	R	U	1															X			
	↓	↓	S		X	9	RW	F	1															X	N	W	380005
54MW-10	12.21.04	1610	S		X	9	M	U	4						(4)												
	↓	↓	S		X	9	R	U	1															X			
	↓	↓	S		X	9	RW	F	1															X	N	W	380006

TG
4 8
4 8

Box #1			
1. Soil	6. Trip Blank		
2. Sediment	7. Oil		
3. Surface Water	8. Waste		
4. Possible Fill	9. Other gw groundwater		
5. Rinsate			

Box #2		
Y. Yellow / HCl	W. White / None	E. En Core / None
S. Salmon / None	M. Manila / None	O. Other
G. Green / None	DB. Dark Blue / H_2SO_4	
LB. Lt. Blue / NaOH	LY. Light Yellow / None	
R. Red / HNO_3	RW. Red & White Stripes / HNO_3	

Box #3	
F. Filtered	
U. Unfiltered	

Box #4	
R. Rush - 3 Day	
S. Standard - 28 Day	
T. Timely - 14 Day	
O. Other _____	

1. Relinquished by:	Date time	2. Relinquished by:	Date Time
David Copen	12.21.04 1700		
1. Received by:	Date time	2. Received by:	Date Time
John Smith	12-22-04 10:25		

Additional Comments:
* 54MW8 per sample tag
36440-25

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.

Cooler TMO 753

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

49-15

Lab Contact: Walt Roudebush 616.975.4561
AIRBILL No:
Courier: Fed Ex

(1)

Radford Army Ammunition Plant
Chain of Custody Record

COC# 011

(#2)

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Cozin & Darren Renne

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW8MS/MSD	12-21-04	1435	5		X	GW	M	U	12						(12)										See COC#010

Don't use for log-in

Box #1			
1. Soil	6. Trip Blank		
2. Sediment	7. Oil		
3. Surface Water	8. Waste		
4. Possible Fill	9. Other GW groundwater		
5. Rinsate			

Box #2		
Y. Yellow / HCl	W. White / None	E. En Core / None
S. Salmon / None	M. Manila / None	O. Other
G. Green / None	DB. Dark Blue / H_2SO_4	
LB. Lt. Blue / NaOH	LY. Light Yellow / None	
R. Red / HNO_3	RW. Red & White Stripes / HNO_3	

Box #3	
F. Filtered	
U. Unfiltered	

Box #4	
R. Rush - 3 Day	
S. Standard - 28 Day	
T. Timely - 14 Day	
O. Other _____	

1. Relinquished by:	Date time	2. Relinquished by:	Date Time	Additional Comments:
David Cozin	12.21.04 1700			36440-25
1. Received by:	Date time	2. Received by:	Date Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Joshua [illegible]	12-22-04 10:35			

Cooler TMOXH

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

49-15

(2)

Radford Army Ammunition Plant
Chain of Custody Record

COC # 012

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Copen & Darren Renne

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	Manganese	SAC 005	MS Matrix Code	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54MW9	12-21-04	1320	S		X	9	M	U	4						(#2)												
			S		X	9	R	U	1															X (#6)			
			S		X	9	RW	F	1															X (#15)	N	32	380007
DUP-1	12-21-04	—	S		X	9	M	U	4						(#2)												
		—	S		X	9	R	U	1															X (#6)			
		—	S		X	9	RW	F	1															X (#15)	N	32	380008

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Box #1
1. Soil
2. Sediment
3. Surface Water
4. Possible Fill
5. Rinsate
6. Trip Blank
7. Oil
8. Waste
9. Other GW groundwater

Box #2
Y. Yellow / HCl
S. Salmon / None
G. Green / None
LB. Lt. Blue / NaOH
R. Red / HNO_3
W. White / None
M. Manila / None
DB. Dark Blue / H_2SO_4
LY. Light Yellow / None
RW. Red & White Stripes / HNO_3
E. En Core / None
O. Other

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard - 28 Day
T. Timely - 14 Day
O. Other _____

1. Relinquished by: David Copen — Date time: 12-21-04 1700
2. Relinquished by: — Date Time:
1. Received by: — Date time: 12-22-04 10:25
2. Received by: — Date Time:

Additional Comments: 36440-25

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.

Cooler TM0443

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

49-15

(3)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: URS - RFAAP | Project-Submittal No.: (new) / add to 36440-25
Receipt Record Page/Line No.: 49-15 | Project Chemist: WDR | Sample Nos.:

Coolers Received

Recorded by (initials/date): YAK 12-22-04

☑ Cooler ☐ Box ☐ Other_____ | Qty Received: 3

Thermometer Used: ☑ IR Gun (#94) ☐ Digital Thermometer (#54) ☐ Other (#_____) | ☐ See Additional Cooler Information Form

Cooler No.	Time
TM0443	12:55

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact
Coolant Location: (Dispersed) / Top / Middle / Bottom
Coolant/Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	2.8	0	2.8
tb location: (representative) / in ice			
1	2.8	0	2.8
2	3.1	0	3.1
3	2.4	0	2.4
		Average °C	2.8

☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time
TM0753	13:03

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact
Coolant Location: (Dispersed) / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	2.7	0	2.7
tb location: (representative) / in ice			
1	2.7	0	2.7
2	2.9	0	2.9
3	3.0	0	3.0
		Average °C	2.9

☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time
TM0244	13:13

Custody Seals: ☐ none ☑ present / intact ☐ present / not intact
Coolant Location: (Dispersed) / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers
Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	3.9	0	3.9
tb location: (representative) / in ice			
1	2.7	0	2.7
2	2.8	0	2.8
3	3.3	0	2.3
		Average °C	2.6

☐ Cooler ID on COC? ☐ VOC trip blank received?

Cooler No.	Time

Custody Seals: ☐ none ☐ present / intact ☐ present / not intact
Coolant Location: Dispersed / Top / Middle / Bottom
Coolant / Temperature Taken Via: ☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers
Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

☐ Cooler ID on COC? ☐ VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by _____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☑	☐		Other _____

COC ID Nos.: 010, 011, 012

☐ TriMatrix

☑ Other (name or ID#) RFAAP

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☐	☑	Sample ID matches COC?
☑	■	Sample date and time matches COC?
☑		Container type completed on COC?
☑	■	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
	■	☑	Broken containers/lids?
	■	☑	Missing or incomplete labels?
	■	☑	Illegible information on labels?
	■	☑	Low volume received?
	■	☑	Inappropriate containers received?
☑	■	☐	VOC vials have headspace?
☐	■	☑	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☑	☐	All sample temperatures ≤4° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☑		■ Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☐ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) _____
☐ No analysis requested, Proj. Chemist completed (init./date) _____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
12-22-04 10:25	12-22-04 12:32	Yes (No)

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: H4J140182 **Fraction:** Perchlorate

Lab: STL-Knoxville **Project Name:** Radford_SWMU_54

Reviewer: Andrea_Sansom **Date:** October_28,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The matrix spike duplicate performed on field sample 54GP79 displayed a percent recovery greater than the upper control limit of 120% at 136%. This matrix spike pair displayed a relative percent difference greater than the control limit of 15% at 28%. Since the associated field sample result was non-detect and the matrix spike displayed an acceptable recovery at 102%, no data qualifying action was taken.

Correctable Anomalies: None.

Comments: None.

Signed: Andrea Sansom

Andrea Sansom

SAMPLE SUMMARY

H4J140182

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
GTKM2	001	54GP81	10/12/04	10:05
GTKM6	002	54GP82	10/12/04	10:35
GTKM8	003	54GP83	10/12/04	11:45
GTKNA	004	54GP79	10/12/04	14:10
GTKNC	005	DUP-1	10/12/04	
GTKNE	006	54GP78	10/12/04	16:00
GTKNG	007	54GP77	10/13/04	10:45
GTKNK	008	54GP86	10/13/04	11:45
GTKNL	009	54GP84	10/13/04	15:15
GTKN8	010	54GP80	10/13/04	16:40

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

URS Corporation

Client Sample ID: 54GP81

General Chemistry

Lot-Sample #...: H4J140182-001 **Work Order #...:** GTKM2 **Matrix.....:** WG
Date Sampled...: 10/12/04 **Date Received..:** 10/14/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	**1.0**	**1.0**	**ug/L**	**EPA-DW1 314.0**	**10/18/04**	**4293399**

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GP82

General Chemistry

Lot-Sample #...: H4J140182-002 **Work Order #...:** GTKM6 **Matrix.....:** WG
Date Sampled...: 10/12/04 **Date Received..:** 10/14/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	10/18/04	4293399

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GP83

General Chemistry

Lot-Sample #...: H4J140182-003 **Work Order #...:** GTKM8 **Matrix.....:** WG
Date Sampled...: 10/12/04 **Date Received..:** 10/14/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	10/18/04	4293399

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GP79

General Chemistry

Lot-Sample #...: H4J140182-004 **Work Order #...:** GTKNA **Matrix.....:** WG
Date Sampled...: 10/12/04 **Date Received..:** 10/14/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	10/18/04	4293399

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: DUP-1

General Chemistry

Lot-Sample #...: H4J140182-005 **Work Order #...:** GTKNC **Matrix.....:** WG
Date Sampled...: 10/12/04 **Date Received..:** 10/14/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	10/18/04	4293399

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GP78

General Chemistry

Lot-Sample #...: H4J140182-006 **Work Order #...:** GTKNE **Matrix.....:** WG
Date Sampled...: 10/12/04 **Date Received..:** 10/14/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	10/18/04	4293399

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GP77

General Chemistry

Lot-Sample #...: H4J140182-007 **Work Order #...:** GTKNG **Matrix.....:** WG
Date Sampled...: 10/13/04 **Date Received..:** 10/14/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	**3.5**	**1.0**	**ug/L**	**EPA-DW1 314.0**	**10/18/04**	**4293399**

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GP86

General Chemistry

Lot-Sample #...: H4J140182-008 **Work Order #...:** GTKNK **Matrix.....:** WG
Date Sampled...: 10/13/04 **Date Received..:** 10/14/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	10/18/04	4293399

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GP84

General Chemistry

Lot-Sample #...: H4J140182-009 **Work Order #...:** GTKNL **Matrix.....:** WG
Date Sampled...: 10/13/04 **Date Received..:** 10/14/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	10/18/04	4293399

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GP80

General Chemistry

Lot-Sample #...: H4J140182-010 **Work Order #...:** GTKN8 **Matrix.....:** WG
Date Sampled...: 10/13/04 **Date Received..:** 10/14/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	10/18/04	4293399

Dilution Factor: 1 MDL.....: 0.10

DATA ASSESSMENT WORKSHEET

Reviewer: Andrea Sansom
Perchlorate
Date: 10/28/2004
DV Level: **II** **III** **IV** (circle 1)
Review Document:

EPA method - Modified for USEPA Region III Modifications to NFGs (Inorganic)

Project Name: Radford SWMU 54
Project Number: 21355035.20001
Laboratory: STL-Knoxville
SDG No.: H4J140182
Test Name: Perchlorate
Method No.: E314.0

1.0 Laboratory Deliverables

		Yes	No	NA
1.1a	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.1b	Do sample ID Numbers on COC match those in report?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. %	x		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		
	Action: Resolve any discrepancies before proceding further.			

Notes:

2.0 Holding Times and Preservation

		Yes	No	NA
2.1	Do sample collection, preservation, shipping, and storage condition meet the requirement of the relevant Project Controlling Documents (PCDs)?	x		
	Action: No chemical preservation required.			
2.2	Have technical holding times (28 days), determined from date of sampling to date of analysis (including dilution or reanalysis) been exceeded? If yes, apply J(+)/UJ(-) to all associated analytes.		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, apply J(+)/R(-) to all associated analytes.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were required blanks (MB) prepared/submitted at the appropriate frequency? If not, note in DV report.	x		
3.2	Do any method blanks have positive results above the MDL? Action: If Yes, positive associated sample results less than 5X the concentration in the blank should be qualified "B" indicating the result is qualitatively suspect.		x	
3.3	After correcting for method blank contamination, do any field/equipment/trip blanks have positive results? If so, apply the same rules given above based on the highest blank value of those associated with the sample.		x	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.2	Are all initial calibration correlation coefficients within the control limits (i.e., $r > 0.99$)? If No, apply "R" to all non-detects; "J" to positive results for all samples associated with the calibration.	x		
4.3	Was a instrument performance check (IPC) analyzed at the matrix conductivity threshold (MCT)? If no, verify that the sample chromatagrams do not display this interference.	x		
4.4	Is the $Pd_{A/H} < 25\%$, % recovery between 80-120%, and the retention time shift < 5%. If No, apply R to all results for sample that display this type of interference.	x		
4.5	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Control limit: $\leq \pm 15\%$. If No, apply "R" to all non-detects; "J*" to positive results for all samples associated with the calibration. Positive results are to be used only qualitatively.	x		

Notes:

5.0 Matrix Spikes		Yes	No	NA
5.1	Was a matrix spike analyzed at required frequency per the PCDs?	x		
5.2	Is the %R for the matrix spike and matrix spike duplicate outside the QC limits?	x		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

PDS of 54GP81 @81%

MS of 54GP79 @ 102%

MSD of 54GP79 @ 136% with RPD @ 28% 54GP79 was ND, no action taken.

6.0 Laboratory Control Samples (LCS/LCSDs)		Yes	No	NA
6.1	Were LCS analyzed at required frequency per the PCDs?	x		
6.2	Are there any LCS and/or LCSD recoveries outside the QC limits (i.e., 85-115%)?		x	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
6.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits (i.e., 15%)?		x	
	Action: If Yes, J(+) only.			

Notes:

7.0 Field Duplicates		Yes	No	NA
7.1	Was a field duplicate submitted/analyzed at an appropriate frequency of one per ten?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes: 54GW78 / DUP-1

ND ND

8.0 Laboratory Duplicates (sample duplicate or matrix spike duplicate)		Yes	No	NA
8.1	Was a duplicate analyzed at the correct frequency?	x		
8.2	Are all analyte duplicate results within control limits? If No, J(+) only. Note in DV report any instance where one or another of the pair was positive while the other was negative.	x		

Notes: MSD RPD high, see MS/MSD notes

9.0 Analyte Identification and Detection Limit Verification		Yes	No	NA
9.1	Do retention times in calibrations and samples fall within appropriately developed and applied windows? If not, look for uniform shifts. Failing that, flag all results "R" as qualitatively suspect.	x		
9.2	Verify quantitative results. Do manual calculations agree with reported values to within rounding error? If not, increase audit. If additional errors are found, require resubmission. Notify PM immediately.	x		
9.3	Do detection/reporting limits meet those required by the QAPP and were they properly adjusted for dilution factors and dry weight equivalent of wet weight aliquot)? If not, note affected sample Ids in DV report.	x		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit: 90%)	x		
10.1.1	Number of samples: 10			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

PROJECT NARRATIVE
H4J140182

The results reported herein are applicable to the samples submitted for analysis only.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation is included with this report.

Sample Receipt

There were no problems with the condition of the samples received.

Quality Control

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The matrix spike duplicate recovery for sample 54GP79 was outside control limits for perchlorate. The laboratory control sample showed acceptable results indicating that the analysis was in control. The matrix spike duplicate result are, therefore, attributed to matrix effects.

STL Knoxville maintains the following certifications, approvals and accreditations: Arkansas DEQ Cert. #04-041-0, California DHS ELAP Cert. #2423, Colorado DPHE, Connecticut DPH Cert. #PH-0223, Florida DOH Cert. #E87177, Georgia DNR Cert. #906 (SDWA, expires 6/24/05), Hawaii DOH, Illinois EPA Cert. #000687, Indiana DOH Cert. #C-TN-02, Iowa DNR Cert. #375, Kansas DHE Cert. #E-10349, Kentucky DEP Lab ID #90101, Louisiana DEQ Cert. #03079, Louisiana DOHH Cert. #LA030024, Maryland DHMH Cert. #277, Massachusetts DEP Cert. #M-TN009, Michigan DEQ Lab ID #9933, New Jersey DEP Cert. #TN001, New York DOH Lab #10781, North Carolina DPH Lab ID #21705, North Carolina DEHNR Cert. #64, Oklahoma DEQ ID #9415, Pennsylvania DEP Cert. #68-576, South Carolina DHEC Lab ID #84001001, Tennessee DOH Lab ID #02014, Utah DOH Cert. # QUAN3, Virginia DGS Lab ID #00165, Washington DOE Lab #C120, Wisconsin DNR Lab ID #998044300, US Army Corps of Engineers, Naval Facilities Engineering Service Center, US EPA Perchlorate Approval and USDA Soil Permit #S-46424. This list of approvals is subject to change and does not imply that laboratory certification is available for all parameters reported in this environmental sample data report.

Radford Army Ammunition Plant
Chain of Custody Record

H4J140182 SJL

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container - Plastic	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	Perchlorate	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54GP81	10/12/04	1005			—	9		U	1																1	
54GP82		1035			✓	9		U	1																1	
54GP83		1145			✓	9		U	1																1	Rec'd temp. 3°c
54GP79		1410			✓	9		U	1																1	Custody seals intact
54GP79MS/MSD		1410			✓	9		U	2																2	1 Cooler Fedex#
DUP-1		—			✓	9		U	1																1	839872066485
54GP78		1600			✓	9		U	1																1	MF#10-14-04
54GP77	10/13/04	1045			✓	9		U	1																1	
54GP86	10/13/04	1145			✓	9		U	1																1	
~~54GP85~~	~~10/13/04~~				✓	9		U	1																	JJ
54GP84	10/13/04	1515			✓	9		U	1																1	
54GP80	10/13/04	1640			✓	9		U	1																1	
Temp Blank																										

Box #1			
1. Soil	6. Trip Blank	Box #2	Y. Yellow / HCl
2. Sediment	7. Oil		S. Salmon / None
3. Surface Water	8. Waste		G. Green / None
4. Possible Fill	9. Other GW		LB. Lt. Blue / NaOH
5. Rinsate			R. Red / HNO_3

W. White / None	E. En Core / None	Box #3 F. Filtered
M. Manila / None	O. Other	U. Unfiltered
DB. Dark Blue / H_2SO_4		
LY. Light Yellow / None		
RW. Red & White Stripes / HNO_3		

Box #4	
R. Rush - 3 Day	
S. Standard - 28 Day	
T. Timely - 14 Day	
O. Other _____	

1. Relinquished by:	Date time	2. Relinquished by:	Date Time	Additional Comments:
J Spangler	10/13/04 1745			
1. Received by:	Date time	2. Received by:	Date Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Matthew J Howard	10/14/04 0915:30			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

STL KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Client: Radford Army Ammunition Plant **Project:** SPM Sumna MF#10-1904 **Lot Number:** H4S140182

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ **1a** Do not match COC ☐ **1b** Incomplete information ☐ **1c** Marking smeared ☐ **1d** Label torn ☐ **1e** No label ☐ **1f** COC not received ☐ **1g** Other:	
2. Is the cooler temperature within limits? (North Carolina, 1668, 1613B: 0-4°C; VOST: 10°C) (Cooler temp should be used only if no temp blank.)	✓			☐ **2a** Temp Blank = _____ ☐ **2b** Cooler Temp = _____	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ **3a** Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?	✓			☐ **4a** Not present ☐ **4b** Not intact ☐ **4c** Other:	
5. Were all of the samples listed on the COC received?	✓			☐ **5a** Samples received-not on COC ☐ **5b** Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ **6a** Leaking ☐ **6b** Broken	
7. Were VOA samples received without headspace?			✓	☐ **7a** Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ **8a** Improper container	
9. Did you check for residual chlorine, if necessary?			✓		
10. Were samples received with ≥½ HT remaining?	✓			☐ **10a** Holding time expired ☐ **10b** <½ HT left	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For SOG water samples (1613B, 1668A, 8290, LR PAHs), do samples have visible solids present?			✓	If yes, was SOG notified? _____	
13. Are the coolers intact?	✓			☐ **13a** Leaking ☐ **13b** Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ **14a** Not relinquished by client	
15. Are tests/parameters listed for each sample?	✓			☐ **15a** Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ **15a** Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ **15a** Incomplete information	
18. Is the client and project name/# identified?	✓			☐ **15a** Incomplete information	
19. Was the sampler identified on the COC?	✓			☐ **15a** Incomplete information	

Quote #: 57695 PM Instructions: _____

Sample Receiving Associate: Matthew T Howard Date: 10-11-04

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: H4J150165 **Fraction:** Perchlorate

Lab: STL-Knoxville **Project Name:** Radford_SWMU_54

Reviewer: Andrea_Sansom **Date:** October_28,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: None.

Signed: Andrea Sansom

Andrea Sansom

SAMPLE SUMMARY

H4J150165

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
GTN8V	002	54GP85	10/14/04	09:45
GTN8X	003	54GP87	10/14/04	12:05

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

URS Corporation

Client Sample ID: 54GP85

General Chemistry

Lot-Sample #...: H4J150165-002 **Work Order #...:** GTN8V **Matrix.....:** WG
Date Sampled...: 10/14/04 **Date Received..:** 10/15/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	10/18/04	4293399

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GP87

General Chemistry

Lot-Sample #...: H4J150165-003 **Work Order #...:** GTN8X **Matrix.....:** WG
Date Sampled...: 10/14/04 **Date Received..:** 10/15/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	10/18/04	4293399

Dilution Factor: 1 MDL.....: 0.10

DATA ASSESSMENT WORKSHEET

Reviewer: Andrea Sansom
Date: 10/28/2004
DV Level: **II** **III** **IV** (circle 1)
Review Document:

Perchlorate

Project Name: Radford SWMU 54
Project Number: 21355035.20001
Laboratory: STL-Knoxville
SDG No.: H4J150165
Test Name: Perchlorate
Method No.: E314.0

EPA method - Modified for USEPA Region III Modifications to NFGs (Inorganic)

1.0 Laboratory Deliverables		**Yes**	**No**	**NA**
1.1a	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.1b	Do sample ID Numbers on COC match those in report?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. %	x		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		
	Action: Resolve any discrepancies before proceding further.			

Notes:

2.0 Holding Times and Preservation		**Yes**	**No**	**NA**
2.1	Do sample collection, preservation, shipping, and storage condition meet the requirement of the relevant Project Controlling Documents (PCDs)?	x		
	Action: No chemical preservation required.			
2.2	Have technical holding times (28 days), determined from date of sampling to date of analysis (including dilution or reanalysis) been exceeded? If yes, apply J(+)/UJ(-) to all associated analytes.		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, apply J(+)/R(-) to all associated analytes.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were required blanks (MB) prepared/submitted at the appropriate frequency? If not, note in DV report.	x		
3.2	Do any method blanks have positive results above the MDL? Action: If Yes, positive associated sample results less than 5X the concentration in the blank should be qualified "B" indicating the result is qualitatively suspect.		x	
3.3	After correcting for method blank contamination, do any field/equipment/trip blanks have positive results? If so, apply the same rules given above based on the highest blank value of those associated with the sample.		x	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.2	Are all initial calibration correlation coefficients within the control limits (i.e., r > 0.99)? If No, apply "R" to all non-detects; "J" to positive results for all samples associated with the calibration.	x		
4.3	Was a instrument performance check (IPC) analyzed at the matrix conductivity threshold (MCT)? If no, verify that the sample chromatagrams do not display this interference.	x		
4.4	Is the $Pd_{A/H}$ < 25%, % recovery between 80-120%, and the retention time shift < 5%. If No, apply R to all results for sample that display this type of interference.	x		
4.5	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Control limit: $\leq \pm$ 15%. If No, apply "R" to all non-detects; "J*" to positive results for all samples associated with the calibration. Positive results are to be used only qualitatively.	x		

Notes:

5.0 Matrix Spikes		Yes	No	NA
5.1	Was a matrix spike analyzed at required frequency per the PCDs?			x
5.2	Is the %R for the matrix spike and matrix spike duplicate outside the QC limits?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: Found in SDG H4J140182:

PDS of 54GP81 @81%

MS of 54GP79 @ 102%

MSD of 54GP79 @ 136% with RPD @ 28% 54GP79 was ND, no action taken.

6.0 Laboratory Control Samples (LCS/LCSDs)		Yes	No	NA
6.1	Were LCS analyzed at required frequency per the PCDs?	x		
6.2	Are there any LCS and/or LCSD recoveries outside the QC limits (i.e., 85-115%)?		x	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
6.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits (i.e., 15%)?		x	
	Action: If Yes, J(+) only.			

Notes:

7.0 Field Duplicates		Yes	No	NA
7.1	Was a field duplicate submitted/analyzed at an appropriate frequency of one per ten?			x
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes: 54GW78 / DUP-1 Found in SDG H4J140182

ND ND

8.0 Laboratory Duplicates (sample duplicate or matrix spike duplicate)		Yes	No	NA
8.1	Was a duplicate analyzed at the correct frequency?			x
8.2	Are all analyte duplicate results within control limits? If No, J(+) only. Note in DV report any instance where one or another of the pair was positive while the other was negative.			

Notes: MSD RPD high, see MS/MSD notes

9.0 Analyte Identification and Detection Limit Verification		Yes	No	NA
9.1	Do retention times in calibrations and samples fall within appropriately developed and applied windows? If not, look for uniform shifts. Failing that, flag all results "R" as qualitatively suspect.	x		
9.2	Verify quantitative results. Do manual calculations agree with reported values to within rounding error? If not, increase audit. If additional errors are found, require resubmission. Notify PM immediately.	x		
9.3	Do detection/reporting limits meet those required by the QAPP and were they properly adjusted for dilution factors and dry weight equivalent of wet weight aliquot)? If not, note affected sample Ids in DV report.	x		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit: 90%)	x		
10.1.1	Number of samples: 2			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

PROJECT NARRATIVE
H4J150165

The results reported herein are applicable to the samples submitted for analysis only.

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The original chain of custody documentation is included with this report.

Sample Receipt

There were no problems with the condition of the samples received.

Quality Control

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

STL Knoxville maintains the following certifications, approvals and accreditations: Arkansas DEQ Cert. #04-041-0, California DHS ELAP Cert. #2423, Colorado DPHE, Connecticut DPH Cert. #PH-0223, Florida DOH Cert. #E87177, Georgia DNR Cert. #906 (SDWA, expires 6/24/05), Hawaii DOH, Illinois EPA Cert. #000687, Indiana DOH Cert. #C-TN-02, Iowa DNR Cert. #375, Kansas DHE Cert. #E-10349, Kentucky DEP Lab ID #90101, Louisiana DEQ Cert. #03079, Louisiana DOHH Cert. #LA030024, Maryland DHMH Cert. #277, Massachusetts DEP Cert. #M-TN009, Michigan DEQ Lab ID #9933, New Jersey DEP Cert. #TN001, New York DOH Lab #10781, North Carolina DPH Lab ID #21705, North Carolina DEHNR Cert. #64, Oklahoma DEQ ID #9415, Pennsylvania DEP Cert. #68-576, South Carolina DHEC Lab ID #84001001, Tennessee DOH Lab ID #02014, Utah DOH Cert. # QUAN3, Virginia DGS Lab ID #00165, Washington DOE Lab #C120, Wisconsin DNR Lab ID #998044300, US Army Corps of Engineers, Naval Facilities Engineering Service Center, US EPA Perchlorate Approval and USDA Soil Permit #S-46424. This list of approvals is subject to change and does not imply that laboratory certification is available for all parameters reported in this environmental sample data report.

Radford Army Ammunition Plant
Chain of Custody Record

H4J150165

STL Labs
Knoxville

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: John Spangler

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	Perchlorate		REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54GP85 -	10-13/10-14-04				✓	9		U	1															1		"HOLD" (500mL)
54GP85 -	10/14/04	9:45			✓	9		U	1															1		1L wide mouth
54GP87 -	10/14/04	1205			✓	9		U	1															1		
DUP-2	10/14/04	-			✓	9		U	1															1		"HOLD"
Temp Blank	10/14/04																									
																				Rec'd temp. 4 °C						
																				Custody seals intact						
																				Cooler Fedex #						
																				8398 7806 6452						
																				MFH 10-15-04						

Box #1 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other GW

Box #2 Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3 F. Filtered; U. Unfiltered

Box #4 R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date time	2. Relinquished by:	Date Time	Additional Comments:
John Spangler	10/14/04 15:00			
1. Received by:	Date time	2. Received by:	Date Time	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Matthew F. Howard	10-15-04, 09:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

STL KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Client: Radford Army Ammunition Plant **Project:** ~~STL~~ SWMU 54 MFH 10-15-04 **Lot Number:** HMJ150165

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ 1a Do not match COC ☐ 1b Incomplete information ☐ 1c Marking smeared ☐ 1d Label torn ☐ 1e No label ☐ 1f COC not received ☐ 1g Other:	
2. Is the cooler temperature within limits? (North Carolina, 1668, 1613B: 0-4°C; VOST: 10°C) (Cooler temp should be used only if no temp blank.)	✓			☐ 2a Temp Blank = _____ ☐ 2b Cooler Temp = _____	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ 3a Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?	✓			☐ 4a Not present ☐ 4b Not intact ☐ 4c Other:	
5. Were all of the samples listed on the COC received?	✓			☐ 5a Samples received-not on COC ☐ 5b Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ 6a Leaking ☐ 6b Broken	
7. Were VOA samples received without headspace?			✓	☐ 7a Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ 8a Improper container	
9. Did you check for residual chlorine, if necessary?			✓		
10. Were samples received with ≥½ HT remaining?	✓			☐ 10a Holding time expired ☐ 10b <½ HT left	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For SOG water samples (1613B, 1668A, 8290, LR PAHs), do samples have visible solids present?			✓	If yes, was SOG notified? _____	
13. Are the coolers intact?	✓			☐ 13a Leaking ☐ 13b Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ 14a Not relinquished by client	
15. Are tests/parameters listed for each sample?	✓			☐ 15a Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ 15a Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ 15a Incomplete information	
18. Is the client and project name/# identified?	✓			☐ 15a Incomplete information	
19. Was the sampler identified on the COC?	✓	X		☒ 15a Incomplete information	

Quote #: 57695 PM Instructions: MFH 10-15-04

Sample Receiving Associate: Matthew T Hoover Date: 10-15-04

QA026R14.doc, 7/12/04

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: H4L220192 **Fraction:** Perchlorate

Lab: STL-Knoxville **Project Name:** Radford_SWMU_54

Reviewer: Andrea_Sansom **Date:** February_7,_2005

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: All data are usable for their intended purpose based on the data reviewed.

Signed: Andrea Sansom
Andrea Sansom

SAMPLE SUMMARY

H4L220192

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
G1NAV	001	54MW-9	12/21/04	13:20
G1NA0	002	54MW-8	12/21/04	14:35
G1NA5	003	54MW-10	12/21/04	16:10
G1NA8	004	DUP-1	12/21/04	

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

URS Corporation

Client Sample ID: 54MW-9

General Chemistry

Lot-Sample #...: H4L220192-001 Work Order #...: G1NAV Matrix.....: WG
Date Sampled...: 12/21/04 Date Received..: 12/22/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	0.21 B	1.0	ug/L	EPA-DW1 314.0	01/04/05	5005144

Dilution Factor: 1 MDL.....: 0.10

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

URS Corporation

Client Sample ID: 54MW-8

General Chemistry

Lot-Sample #...: H4L220192-002 Work Order #...: G1NA0 Matrix.....: WG
Date Sampled...: 12/21/04 Date Received..: 12/22/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	0.22 B	1.0	ug/L	EPA-DW1 314.0	01/04/05	5005144
	Dilution Factor: 1			MDL.....: 0.10		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

URS Corporation

Client Sample ID: 54MW-10

General Chemistry

Lot-Sample #...: H4L220192-003 Work Order #...: G1NA5 Matrix.....: WG
Date Sampled...: 12/21/04 Date Received..: 12/22/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	9.8	1.0	ug/L	EPA-DW1 314.0	01/04/05	5005144

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: DUP-1

General Chemistry

Lot-Sample #...: H4L220192-004 Work Order #...: G1NA8 Matrix.....: WG
Date Sampled...: 12/21/04 Date Received..: 12/22/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	9.1	1.0	ug/L	EPA-DW1 314.0	01/04/05	5005144

Dilution Factor: 1 MDL.....: 0.10

DATA ASSESSMENT WORKSHEET

Reviewer: Andrea Sansom
Date: 2/7/2005
DV Level: II III IV (circle 1)
Review Document:

Perchlorate

EPA method - Modified for USEPA Region III Modifications to NFGs (Inorganic)

Project Name: Radford SWMU 54
Project Number: 21355035.20001
Laboratory: STL-Knoxville
SDG No.: H4J220192
Test Name: Perchlorate
Method No.: E314.0

1.0 Laboratory Deliverables

		Yes	No	NA
1.1a	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.1b	Do sample ID Numbers on COC match those in report?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. %	X		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		
	Action: Resolve any discrepancies before proceding further.			

Notes:

2.0 Holding Times and Preservation

		Yes	No	NA
2.1	Do sample collection, preservation, shipping, and storage condition meet the requirement of the relevant Project Controlling Documents (PCDs)?	X		
	Action: No chemical preservation required.			
2.2	Have technical holding times (28 days), determined from date of sampling to date of analysis (including dilution or reanalysis) been exceeded? If yes, apply J(+)/UJ(-) to all associated analytes.		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, apply J(+)/R(-) to all associated analytes.		X	

Notes:

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were required blanks (MB) prepared/submitted at the appropriate frequency? If not, note in DV report.	X		
3.2	Do any method blanks have positive results above the MDL? Action: If Yes, positive associated sample results less than 5X the concentration in the blank should be qualified "B" indicating the result is qualitatively suspect.		X	
3.3	After correcting for method blank contamination, do any field/equipment/trip blanks have positive results? If so, apply the same rules given above based on the highest blank value of those associated with the sample.		X	

Notes:

4.0 Initial and Continuing Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.2	Are all initial calibration correlation coefficients within the control limits (i.e., r > 0.99)? If No, apply "R" to all non-detects; "J" to positive results for all samples associated with the calibration.	X		
4.3	Was a instrument performance check (IPC) analyzed at the matrix conductivity threshold (MCT)? If no, verify that the sample chromatagrams do not display this interference.	X		
4.4	Is the $Pd_{A/H}$ < 25%, % recovery between 80-120%, and the retention time shift < 5%. If No, apply R to all results for sample that display this type of interference.	X		
4.5	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Control limit: $\leq \pm$ 15%. If No, apply "R" to all non-detects; "J*" to positive results for all samples associated with the calibration. Positive results are to be used only qualitatively.	X		

Notes:

5.0 Matrix Spikes

		Yes	No	NA
5.1	Was a matrix spike analyzed at required frequency per the PCDs?	X		
5.2	Is the %R for the matrix spike and matrix spike duplicate outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

6.0 Laboratory Control Samples (LCS/LCSDs)

		Yes	No	NA
6.1	Were LCS analyzed at required frequency per the PCDs?	X		
6.2	Are there any LCS and/or LCSD recoveries outside the QC limits (i.e., 85-115%)?		X	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
6.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits (i.e., 15%)?			X
	Action: If Yes, J(+) only.			

Notes:

7.0 Field Duplicates

		Yes	No	NA
7.1	Was a field duplicate submitted/analyzed at an appropriate frequency of one per ten?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes: 54GW78 / DUP-1 RPD

9.8 9.1 7.4%

8.0 Laboratory Duplicates (sample duplicate or matrix spike duplicate)		Yes	No	NA
8.1	Was a duplicate analyzed at the correct frequency?	X		
8.2	Are all analyte duplicate results within control limits? If No, J(+) only. Note in DV report any instance where one or another of the pair was positive while the other was negative.	X		

Notes:

9.0 Analyte Identification and Detection Limit Verification		Yes	No	NA
9.1	Do retention times in calibrations and samples fall within appropriately developed and applied windows? If not, look for uniform shifts. Failing that, flag all results "R" as qualitatively suspect.	X		
9.2	Verify quantitative results. Do manual calculations agree with reported values to within rounding error? If not, increase audit. If additional errors are found, require resubmission. Notify PM immediately.	X		
9.3	Do detection/reporting limits meet those required by the QAPP and were they properly adjusted for dilution factors and dry weight equivalent of wet weight aliquot)? If not, note affected sample Ids in DV report.	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit: 90%)	X		
10.1.1	Number of samples: 4			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

PROJECT NARRATIVE
H4L220192

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There were no problems with the condition of the samples received.

Quality Control

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

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H4L220192

STL Knoxville

5815 Middlebrook Pike • Knoxville, TN 37921-5947
Phone: (865) 291-3000 • Fax: (865) 584-4315
Receiving: (865) 291-3031

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No.
Page 1 of ____

Project Name/No. [1] RPAPP - SWMU 54
Sample Team Members [2] DC / DR
Profit Center No. [3]
Project Manager [4] Darren Renne
Purchase Order No. [6]
Required Report Date [11]

Samples Shipment Date [7] 12-21-04
Lab Destination [8] STL - Knoxville
Lab Contact [9]
Project Contact / Phone [12] 804.965.9000
Carrier / Waybill No. [13]

Bill to: [5] URS Corporation
5540 Falmouth St. Suite 201
Richmond, VA 23230

Report to: [10] Same as above

ONE CONTAINER PER LINE

Sample [14] Number	Sample [15] Type	Date/Time [16] Collected	Container [17] Type	Sample [18] Volume	Pre- [19] servative	Requested Testing [20] Program	Condition on Receipt [21] Lab use only
54mw-9	Aqueous	12-21-04 1320	Plastic	500mL	none	EPA 314.0 Perchlorate	Custody seals intact (Y) N NA
54mw-8 MS	↓	12-21-04 1435	↓	↓	none	↓	Temperature received at 2C
54 mw-8 MSD		12-21-04 1435			none		Received by ADF Date 122204
54 mw-8		12-21-04 1435			none		Number of packages 1
54 mw-10	↓	12-21-04 1610	↓	↓	none	↓	Tracking # 850421141958
							ADF 12-22-04
DUP-1	Aqueous	12-21-04	Plastic	500mL	none	EPA 314.0 Perchlorate	

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-Hazard ☒ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature / Affiliation) David Green URS Corp — Date: 12-21-04 Time: 1645
1. Received by [28] (Signature / Affiliation) Andrew D. Filmore — Date: 12-22-04 Time: 1100
1. Relinquished by (Signature / Affiliation) — Date: ____ Time: ____
1. Received by (Signature / Affiliation) — Date: ____ Time: ____

Comments: [29]

White: To accompany samples
Yellow: Field copy

STL KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Client: UES **Project:** _____ **Lot Number:** 440220192

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ 1a Do not match COC ☐ 1b Incomplete information ☐ 1c Marking smeared ☐ 1d Label torn ☐ 1e No label ☐ 1f COC not received ☐ 1g Other:	
2. Is the cooler temperature within limits? (North Carolina, 1668, 1613B: 0-4°C; VOST: 10°C) (Cooler temp should be used only if no temp blank.)	✓			☐ 2a Temp Blank = _____ ☐ 2b Cooler Temp = _____	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ 3a Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?	✓			☐ 4a Not present ☐ 4b Not intact ☐ 4c Other:	
5. Were all of the samples listed on the COC received?	✓			☐ 5a Samples received-not on COC ☐ 5b Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ 6a Leaking ☐ 6b Broken	
7. Were VOA samples received without headspace?			✓	☐ 7a Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ 8a Improper container	
9. Did you check for residual chlorine, if necessary?			✓	☐ 9a Could not be determined due to matrix interference	
10. Were samples received within holding time?	✓			☐ 10a Holding time expired	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For SOG water samples (1613B, 1668A, 8290, LR PAHs), do samples have visible solids present?			✓	If yes, was SOG notified? _____	
13. Are the shipping containers intact?	✓			☐ 13a Leaking ☐ 13b Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ 14a Not relinquished by client	
15. Are tests/parameters listed for each sample?	✓			☐ 15a Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ 15a Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ 15a Incomplete information	
18. Is the client and project name/# identified?	✓			☐ 15a Incomplete information	
19. Was the sampler identified on the COC?	✓				

Quote #: 57695 PM Instructions: _____

Sample Receiving Associate: Andrew D. Flores Date: 12·22·04

QA026R15.doc, 11/15/04

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: RAAP002 **Fraction:** Perchlorate

Lab: STL-Knoxville **Project Name:** Radford_SWMU54

Reviewer: Andrea_Sansom **Date:** September_22,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: Matrix spikes displayed percent recoveries less than the lower control limit of 80% for sample 54GW66 at 70%, 54GW67 at 76%, and 54GW69 at 74%. The parent sample results were estimate detections that were flagged "J,m".

Correctable Anomalies: The laboratory revised the result forms to include the method detection limit and to report five estimate detections that were not originally reported.

Comments: The collection date and time on the chain of custody and custody seals were inadvertently omitted for samples received by STL-Knoxville on 08/21/2004. The laboratory logged in per the container labels. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

SAMPLE SUMMARY

RAAP002 : H4H190193

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
GNG14	001	54GW57	08/17/04	20:55
GNG2D	002	54GW56	08/18/04	12:15
GNG2F	003	54GW59	08/18/04	15:00
GNG2H	004	DUP-3 / 54GW59	08/18/04	

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

(Continued on next page)

SAMPLE SUMMARY

RAAP002 : H4H210104

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
GNMT7	001	54GW70	08/20/04	
GNMT8	002	54GW68	08/20/04	
GNMT9	003	54GW65	08/20/04	
GNMVA	004	54GW66	08/20/04	
GNMVC	005	54GW67	08/20/04	
GNMVD	006	54GW69	08/20/04	

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

(Continued on next page)

SAMPLE SUMMARY

RAAP002 : H4H240129

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
GNQ6G	001	54GW64	08/23/04	15:00
GNQ6H	002	54GW63	08/23/04	15:45
GNQ6J	003	54GW62	08/23/04	16:00
GNQ6K	004	DUP-9 /54GW64	08/23/04	

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

(Continued on next page)

SAMPLE SUMMARY

RAAP002 : H4H250160

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
GNVWX	001	54GW61	08/24/04	12:45
GNVW0	002	54GW60	08/24/04	11:30
GNVW1	003	54GW58	08/24/04	11:00

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

URS Corporation

Client Sample ID: 54GW57

General Chemistry

Lot-Sample #...: H4H190193-001 Work Order #...: GNG14 Matrix.....: WG
Date Sampled...: 08/17/04 Date Received..: 08/19/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	2.0	1.0	ug/L	EPA-DW1 314.0	08/25/04	4240149

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GW56

General Chemistry

Lot-Sample #...: H4H190193-002 **Work Order #...:** GNG2D **Matrix.....:** WG
Date Sampled...: 08/18/04 **Date Received..:** 08/19/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	**13.5**	**1.0**	**ug/L**	**EPA-DW1 314.0**	**08/25/04**	**4240149**

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GW59

General Chemistry

Lot-Sample #...: H4H190193-003 Work Order #...: GNG2F Matrix.....: WG
Date Sampled...: 08/18/04 Date Received..: 08/19/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	4.0	1.0	ug/L	EPA-DW1 314.0	08/25/04	4240149

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: DUP-3

General Chemistry

Lot-Sample #...: H4H190193-004 **Work Order #...:** GNG2H **Matrix.....:** WG
Date Sampled...: 08/18/04 **Date Received..:** 08/19/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	**3.6**	**1.0**	**ug/L**	**EPA-DW1 314.0**	**08/25/04**	**4240149**

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GW70

General Chemistry

Lot-Sample #...: H4H210104-001 Work Order #...: GNMT7 Matrix.....: WG
Date Sampled...: 08/20/04 Date Received..: 08/21/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	0.76 B	1.0	ug/L	EPA-DW1 314.0	08/31/04	4245418
	Dilution Factor: 1			MDL.....: 0.10		

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

URS Corporation

Client Sample ID: 54GW68

General Chemistry

Lot-Sample #...: H4H210104-002 Work Order #...: GNMT8 Matrix.....: WG
Date Sampled...: 08/20/04 Date Received..: 08/21/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	08/31/04	4245418

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GW65

General Chemistry

Lot-Sample #...: H4H210104-003 Work Order #...: GNMT9 Matrix.....: WG
Date Sampled...: 08/20/04 Date Received..: 08/21/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	1.7	1.0	ug/L	EPA-DW1 314.0	08/31/04	4245418

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GW66

General Chemistry

Lot-Sample #...: H4H210104-004 Work Order #...: GNMVA Matrix.....: WG
Date Sampled...: 08/20/04 Date Received..: 08/21/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	0.94 B	1.0	ug/L	EPA-DW1 314.0	08/31/04	4245418

Dilution Factor: 1 MDL.....: 0.10

NOTE(S): J,M

RL Reporting Limit

B Estimated result. Result is less than RL.

URS Corporation

Client Sample ID: 54GW67

General Chemistry

Lot-Sample #...: H4H210104-005 Work Order #...: GNMVC Matrix.....: WG
Date Sampled...: 08/20/04 Date Received..: 08/21/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	0.59 B	1.0	ug/L	EPA-DW1 314.0	08/31/04	4245418

Dilution Factor: 1 MDL.....: 0.10

NOTE(S): J, M

RL Reporting Limit

B Estimated result. Result is less than RL.

URS Corporation

Client Sample ID: 54GW69

General Chemistry

Lot-Sample #...: H4H210104-006 Work Order #...: GNMVD Matrix.....: WG
Date Sampled...: 08/20/04 Date Received..: 08/21/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	0.65 B	1.0	ug/L	EPA-DW1 314.0	08/31/04	4245418

Dilution Factor: 1 MDL.....: 0.10

NOTE(S): J, M

RL Reporting Limit

B Estimated result. Result is less than RL.

URS Corporation

Client Sample ID: 54GW64

General Chemistry

Lot-Sample #...: H4H240129-001 **Work Order #...:** GNQ6G **Matrix.....:** WG
Date Sampled...: 08/23/04 **Date Received..:** 08/24/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	**1.1**	**1.0**	**ug/L**	**EPA-DW1 314.0**	**08/31/04**	**4245418**

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GW63

General Chemistry

Lot-Sample #...: H4H240129-002 **Work Order #...:** GNQ6H **Matrix.....:** WG
Date Sampled...: 08/23/04 **Date Received..:** 08/24/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	EPA-DW1 314.0	08/31/04	4245418

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GW62

General Chemistry

Lot-Sample #...: H4H240129-003 **Work Order #...:** GNQ6J **Matrix.....:** WG
Date Sampled...: 08/23/04 **Date Received..:** 08/24/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	**5.3**	**1.0**	**ug/L**	**EPA-DW1 314.0**	**08/31/04**	**4245418**

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: DUP-9

General Chemistry

Lot-Sample #...: H4H240129-004 Work Order #...: GNQ6K Matrix.....: WG
Date Sampled...: 08/23/04 Date Received..: 08/24/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	0.97 B	1.0	ug/L	EPA-DW1 314.0	08/31/04	4245418

Dilution Factor: 1 MDL.....: 0.10

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

URS Corporation

Client Sample ID: 54GW61

General Chemistry

Lot-Sample #...: H4H250160-001 **Work Order #...:** GNVWX **Matrix.....:** WG
Date Sampled...: 08/24/04 **Date Received..:** 08/25/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	**3.0**	**1.0**	**ug/L**	**EPA-DW1 314.0**	**08/31/04**	**4245418**

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GW60

General Chemistry

Lot-Sample #...: H4H250160-002 **Work Order #...:** GNVW0 **Matrix.....:** WG
Date Sampled...: 08/24/04 **Date Received..:** 08/25/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	**1.7**	**1.0**	**ug/L**	**EPA-DW1 314.0**	**08/31/04**	**4245418**

Dilution Factor: 1 MDL.....: 0.10

URS Corporation

Client Sample ID: 54GW58

General Chemistry

Lot-Sample #...: H4H250160-003 **Work Order #...:** GNVW1 **Matrix.....:** WG
Date Sampled...: 08/24/04 **Date Received..:** 08/25/04

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	**25.8**	**1.0**	**ug/L**	**EPA-DW1 314.0**	**08/31/04**	**4245418**

Dilution Factor: 1 MDL.....: 0.10

DATA ASSESSMENT WORKSHEET

Reviewer: Andrea Sansom
Date: 9/15/2004
DV Level: **II** **III** **IV** (circle 1)
Review Document:

Perchlorate

Project Name: Radford SWMU 54
Project Number: 21355035.20001
Laboratory: STL-Knoxville
SDG No.: RAAP002
Test Name: Perchlorate
Method No.: E314.0

EPA method - Modified for USEPA Region III Modifications to NFGs (Inorganic)

1.0 Laboratory Deliverables		**Yes**	**No**	**NA**
1.1a	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.1b	Do sample ID Numbers on COC match those in report?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. %	x		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		
	Action: Resolve any discrepancies before proceding further.			

Notes:

some times/dates/seals were missing on one day, lab used labels

2.0 Holding Times and Preservation		**Yes**	**No**	**NA**
2.1	Do sample collection, preservation, shipping, and storage condition meet the requirement of the relevant Project Controlling Documents (PCDs)?	x		
	Action: No chemical preservation required.			
2.2	Have technical holding times (28 days), determined from date of sampling to date of analysis (including dilution or reanalysis) been exceeded? If yes, apply J(+)/UJ(-) to all associated analytes.		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, apply J(+)/R(-) to all associated analytes.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were required blanks (MB) prepared/submitted at the appropriate frequency? If not, note in DV report.	x		
3.2	Do any method blanks have positive results above the MDL? Action: If Yes, positive associated sample results less than 5X the concentration in the blank should be qualified "B" indicating the result is qualitatively suspect.		x	
3.3	After correcting for method blank contamination, do any field/equipment/trip blanks have positive results? If so, apply the same rules given above based on the highest blank value of those associated with the sample.		x	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.2	Are all initial calibration correlation coefficients within the control limits (i.e., $r > 0.99$)? If No, apply "R" to all non-detects; "J" to positive results for all samples associated with the calibration.	x		
4.3	Was a instrument performance check (IPC) analyzed at the matrix conductivity threshold (MCT)? If no, verify that the sample chromatagrams do not display this interference.	x		
4.4	Is the $Pd_{A/H} < 25\%$, % recovery between 80-120%, and the retention time shift < 5%. If No, apply R to all results for sample that display this type of interference.	x		
4.5	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Control limit: $\leq \pm 15\%$. If No, apply "R" to all non-detects; "J*" to positive results for all samples associated with the calibration. Positive results are to be used only qualitatively.	x		

Notes:

5.0 Matrix Spikes		Yes	No	NA
5.1	Was a matrix spike analyzed at required frequency per the PCDs?	x		
5.2	Is the %R for the matrix spike and matrix spike duplicate outside the QC limits?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

three PDSs were less than 80% and greater than 70%

6.0 Laboratory Control Samples (LCS/LCSDs)		Yes	No	NA
6.1	Were LCS analyzed at required frequency per the PCDs?	x		
6.2	Are there any LCS and/or LCSD recoveries outside the QC limits (i.e., 85-115%)?		x	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
6.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits (i.e., 15%)?		x	
	Action: If Yes, J(+) only.			

Notes:

7.0 Field Duplicates		Yes	No	NA
7.1	Was a field duplicate submitted/analyzed at an appropriate frequency of one per ten?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

54GW69 / DUP-9			54GW64 / DUP-9		
4.0	3.6	10%	1.1	0.97	4.00%

8.0 Laboratory Duplicates (sample duplicate or matrix spike duplicate)		Yes	No	NA
8.1	Was a duplicate analyzed at the correct frequency?	x		
8.2	Are all analyte duplicate results within control limits? If No, J(+) only. Note in DV report any instance where one or another of the pair was positive while the other was negative.	x		

Notes:

9.0 Analyte Identification and Detection Limit Verification		Yes	No	NA
9.1	Do retention times in calibrations and samples fall within appropriately developed and applied windows? If not, look for uniform shifts. Failing that, flag all results "R" as qualitatively suspect.	x		
9.2	Verify quantitative results. Do manual calculations agree with reported values to within rounding error? If not, increase audit. If additional errors are found, require resubmission. Notify PM immediately.	x		
9.3	Do detection/reporting limits meet those required by the QAPP and were they properly adjusted for dilution factors and dry weight equivalent of wet weight aliquot)? If not, note affected sample Ids in DV report.	x		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit: 90%)	x		
10.1.1	Number of samples: 13			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

PROJECT NARRATIVE
RAAP002

The results reported herein are applicable to the samples submitted for analysis only.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation is included with this report.

Sample Receipt

The collection data was not listed on the Chain-of-Custody documentation for samples received 08/21/04.

Custody seals were not present upon sample receipt on 08/21/04 at STL Knoxville.

Quality Control

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The matrix spike recovery for sample 54GW66 was outside control limits for perchlorate. The laboratory control samples showed acceptable results indicating that the analysis was in control. The matrix spike result is, therefore, attributed to matrix effects.

STL Knoxville maintains the following certifications, approvals and accreditations: Arkansas DEQ Cert. # 03-049-0, California DHS ELAP Cert. #2423, Colorado DPHE, Connecticut DPH Cert. #PH-0223, Florida DOH Cert. #E87177, Georgia DNR Cert. #906, Hawaii DOH, Illinois EPA Cert. # 000687, Indiana DOH Cert. #C-TN-02, Kansas DHE Cert. # E-10349, Kentucky DEP Lab ID #90101, Louisiana DEQ Cert. #03079, Louisiana DOHH Cert. #LA030024, Maryland DHMH Cert. #277, Massachusetts DEP Cert. #M-TN009, Michigan DEQ Lab ID #9933, New Jersey DEP Cert. #TN001, New York DOH Lab #10781, North Carolina DPH Lab ID #21705, North Carolina DEHNR Cert. #64, Oklahoma DEQ ID #9415, Pennsylvania DEP Cert. # 68-576, South Carolina DHEC Lab ID #84001001, Tennessee DOH Lab ID #02014, Utah DOH Cert. #QUAN3, Virginia DGS Lab ID #00165, Washington DOE Lab #C120, Wisconsin DNR Lab ID #998044300, US Army Corps of Engineers, Naval Facilities Engineering Service Center, US EPA Perchlorate Approval and USDA Soil Permit #S-46424. This list of approvals is subject to change and does not imply that laboratory certification is available for all parameters reported in this environmental sample data report.

1TMA 190193

STL Knoxville

5815 Middlebrook Pike • Knoxville, TN 37921-5947
Phone: (865) 291-3000 • Fax: (865) 584-4315
Receiving: (865) 291-3031

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No.

Page 1 of 1

Project Name/No. [1] RFMAP / SWMU 54

Sample Team Members [2] David Cozen / John Spangler

Profit Center No. [3]

Project Manager [4] Darren Renne

Purchase Order No. [6]

Required Report Date [11]

Samples Shipment Date [7] 8.18.04

Lab Destination [8] STL - Knoxville

Lab Contact [9]

Project Contact / Phone [12] Darren Renne 504.965.6000

Carrier / Waybill No. [13]

Bill to: [5] URS Corporation
5540 Falmouth St. Suite 201
Richmond, VA 23230

Report to: [10] same as above

ONE CONTAINER PER LINE

Sample [14] Number	Sample [15] Type	Date/Time [16] Collected	Container [17] Type	Sample [18] Volume	Pre- [19] servative	Requested Testing [20] Program	Condition on Receipt [21] Lab use only
~~54SB~~ 54GW57 -	Aqua/Grab	8.18.04/2055	250mL plastic	250mL	none	EPA 314.0 Perchlorate	Custody seals intact (Y) N NA
54GW56	Aqua/Grab	8.18.04/1215	↓	↓	↓	↓	Temperature received at 4°C
54GW56 MS/MSD	Aqua/Grab	8.18.04/1215	↓	↓	↓	↓	Received by: MFH Date 8-19-04
54GW59	Aqua/Grab	8.18.04/1500	250mL plastic	250mL	none	EPA 314.0 perchlorate	Number of packages 1
							Tracking # 839872666128
DUP-3	Aqua/Grab	8.18.04/—	250mL plastic	250mL	none	EPA 314.0 perchlorate	

Special Instructions: [23] 54GW57 cond: 532.9 µS { 54GW56 & 54GW56 MS/MSD cond: 516.0 µS } 54GW59 cond: 409.0 µS

Possible Hazard Identification: [24]
Non-Hazard (X) Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab (X) Archive (mos.)

Turnaround Time Required: [26]
Normal (X) Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature / Affiliation) David Cozen / URS — Date: 8.18.04 Time: 1500

1. Received by [28] (Signature / Affiliation) Matthew Hanna — Date: 8-19-04 Time: 0809 MFH 8-19-04

1. Relinquished by (Signature / Affiliation) — Date: Time:

1. Received by (Signature / Affiliation) — Date: Time:

Comments: [29]

White: To accompany samples

Yellow: Field copy

STL KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Client: WRS Corp. **Project:** _____ **Lot Number:** 444190193

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ **1a** Do not match COC ☐ **1b** Incomplete information ☐ **1c** Marking smeared ☐ **1d** Label torn ☐ **1e** No label ☐ **1f** COC not received ☐ **1g** Other:	
2. Is the cooler temperature within limits? (North Carolina, 1668, 1613B: 0-4°C; VOST: 10°C) (Cooler temp should be used only if no temp blank.)	✓			☐ **2a** Temp Blank = _____ ☐ **2b** Cooler Temp = _____	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ **3a** Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?	✓			☐ **4a** Not present ☐ **4b** Not intact ☐ **4c** Other:	
5. Were all of the samples listed on the COC received?	✓			☐ **5a** Samples received-not on COC ☐ **5b** Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ **6a** Leaking ☐ **6b** Broken	
7. Were VOA samples received without headspace?			✓	☐ **7a** Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ **8a** Improper container	
9. Did you check for residual chlorine, if necessary?			✓		
10. Were samples received with ≥½ HT remaining?	✓			☐ **10a** Holding time expired ☐ **10b** <½ HT left	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For SOG water samples (1613B, 1668A, 8290, LR PAHs), do samples have visible solids present?			✓	If yes, was SOG notified? _____	
13. Are the coolers intact?	✓			☐ **13a** Leaking ☐ **13b** Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ **14a** Not relinquished by client	
15. Are tests/parameters listed for each sample?	✓			☐ **15a** Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ **15a** Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ **15a** Incomplete information	
18. Is the client and project name/# identified?	✓			☐ **15a** Incomplete information	
19. Was the sampler identified on the COC?	✓			☐ **15a** Incomplete information	

Quote #: 57095 PM Instructions: _____

Sample Receiving Associate: Matthew T. Howard Date: 8-19-04

Radford Army Ammunition Plant
Chain of Custody Record

H4H 210104

Trimatrix Laboratory
5560 Coporate Exchange Ct. SE
Grand Rapids, MI 49512

Project Number:	Project Name:
SWMU	RFAAP

Project Contact (Name and Phone Number): Darren Renne 804.965.9000

Samplers: David Green

Lab Contact: Walt Roudebush 616.975.4561

AIRBILL No:

Courier: Fed Ex

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
54GW70																		X							
54GW68																		X							
54GW65																		X							
54GW66																		X							
54GW67																		X							
54GW69																		X							
																									Maintain cold Received at 2°C BKD 8-21-04 1 cooler FEDX # 839872016691

Box #1: 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other _____

Box #2: Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other

Box #3: F. Filtered; U. Unfiltered

Box #4: R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date/time	2. Relinquished by:	Date/Time	Additional Comments:
David Green	8-20-04 1945			
1. Received by:	Date/time	2. Received by:	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Ryan Lannon	8-21-04 09:30			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

STL KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Client: URS CORP **Project:** RFAAP **Lot Number:** 144H210104

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ 1a Do not match COC ☐ 1b Incomplete information ☐ 1c Marking smeared ☐ 1d Label torn ☐ 1e No label ☐ 1f COC not received ☐ 1g Other:	ISA, ALL SAMPLES, NO COLLECTION DATE ON COC, WILL USE 8-20-04 FROM LABEL
2. Is the cooler temperature within limits? (North Carolina, 1668, 1613B: 0-4°C; VOST: 10°C) (Cooler temp should be used only if no temp blank.)	✓			☐ 2a Temp Blank = _____ ☐ 2b Cooler Temp = _____	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ 3a Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?		✓		☐ 4a Not present ☐ 4b Not intact ☐ 4c Other:	
5. Were all of the samples listed on the COC received?	✓			☐ 5a Samples received-not on COC ☐ 5b Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ 6a Leaking ☐ 6b Broken	
7. Were VOA samples received without headspace?			✓	☐ 7a Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ 8a Improper container	
9. Did you check for residual chlorine, if necessary?			✓		
10. Were samples received with ≥½ HT remaining?	✓			☐ 10a Holding time expired ☐ 10b <½ HT left	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For SOG water samples (1613B, 1668A, 8290, LR PAHs), do samples have visible solids present?			✓	If yes, was SOG notified? _____	
13. Are the coolers intact?	✓			☐ 13a Leaking ☐ 13b Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ 14a Not relinquished by client	
15. Are tests/parameters listed for each sample?	✓			☐ 15a Incomplete information	
16. Is the matrix of the samples noted?	✓		✓	☐ 15a Incomplete information	
17. Is the date/time of sample collection noted?		✓		☒ 15a Incomplete information	
18. Is the client and project name/# identified?	✓			☐ 15a Incomplete information	
19. Was the sampler identified on the COC?	✓			☐ 15a Incomplete information	

Quote #: 57695 PM Instructions: _____

Sample Receiving Associate: [signature] Date: 8-21-04

QA026R14.doc, 7/12/04

STL Knoxville

5815 Middlebrook Pike • Knoxville, TN 37921-5947
Phone: (865) 291-3000 • Fax: (865) 584-4315
Receiving: (865) 291-3031

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No.
Page 1 of ____

Project Name/No. [1] RFAAP SWMU 54
Sample Team Members [2] David Copen/John Spangler
Profit Center No. [3]
Project Manager [4] Darren Renne
Purchase Order No. [6]
Required Report Date [11] per contract

Samples Shipment Date [7] 8/3/04
Lab Destination [8] STL - Knoxville
Lab Contact [9]
Project Contact / Phone [12]
Carrier / Waybill No. [13]

Bill to: [5] URS Corp.
5540 Falmouth St Suite 201
Richmond, VA 23230
804.965.9000
Report to: [10] same as above

ONE CONTAINER PER LINE

Sample [14] Number	Sample [15] Type	Date/Time [16] Collected	Container [17] Type	Sample [18] Volume	Pre- [19] servative	Requested Testing [20] Program	Condition on Receipt [21] Lab use only
54GW64	Aqua/Grab	8.2.04 1500	250mL plastic	250 mL	none	EPA 314.0 Perchlorate	Custody seals intact (Y) N NA
54GW63	↓	8.2.04 1545	↓	↓	↓	↓	Temperature received at 3°C
54GW62		8.2.04 1600					Received by MH Date 8-24-04
DUP-9		8.2.04					Number of packages 1
							Tracking # 839872066477

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-Hazard ☒ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive ____ (mos.)

Turnaround Time Required: [26] per contract
Normal ☐ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature / Affiliation) David Copen/URS
Date: 8-3-04
Time: 1730

1. Received by [28] (Signature / Affiliation) Matthew Hurd
Date: 8-24-04
Time: 09:30

1. Relinquished by (Signature / Affiliation)
Date:
Time:

1. Received by (Signature / Affiliation)
Date:
Time:

Comments: [29]

White: To accompany samples
Yellow: Field copy

STL KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Client: URS **Project:** _____ **Lot Number:** KNH240129

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ **1a** Do not match COC ☐ **1b** Incomplete information ☐ **1c** Marking smeared ☐ **1d** Label torn ☐ **1e** No label ☐ **1f** COC not received ☐ **1g** Other:	
2. Is the cooler temperature within limits? (North Carolina, 1668, 1613B: 0-4°C; VOST: 10°C) (Cooler temp should be used only if no temp blank.)	✓			☐ **2a** Temp Blank = _____ ☐ **2b** Cooler Temp = _____	
3. Were samples received with correct chemical preservative (excluding Encore)?	✓			☐ **3a** Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?	✓			☐ **4a** Not present ☐ **4b** Not intact ☐ **4c** Other:	
5. Were all of the samples listed on the COC received?	✓			☐ **5a** Samples received-not on COC ☐ **5b** Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ **6a** Leaking ☐ **6b** Broken	
7. Were VOA samples received without headspace?			✓	☐ **7a** Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ **8a** Improper container	
9. Did you check for residual chlorine, if necessary?			✓		
10. Were samples received with ≥½ HT remaining?	✓			☐ **10a** Holding time expired ☐ **10b** <½ HT left	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For SOG water samples (1613B, 1668A, 8290, LR PAHs), do samples have visible solids present?			✓	If yes, was SOG notified? _____	
13. Are the coolers intact?	✓			☐ **13a** Leaking ☐ **13b** Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ **14a** Not relinquished by client	
15. Are tests/parameters listed for each sample?	✓			☐ **15a** Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ **15a** Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ **15a** Incomplete information	
18. Is the client and project name/# identified?	✓			☐ **15a** Incomplete information	
19. Was the sampler identified on the COC?	✓			☐ **15a** Incomplete information	

Quote #: 57695 PM Instructions: _____

Sample Receiving Associate: Matthew Howard Date: 8-24-04

QA026R14.doc, 7/12/04

Radford Army Ammunition Plant
Chain of Custody Record

144H250160

STL-Knoxville
5815 Middlebrook
Knoxville, TN

~~Trimatrix Laboratory~~
~~5500 Coporate Exchange Ct. SE~~
~~Grand Rapids, MI 49512~~

Project Number:	Project Name:
SWMU 54	RFAAP

Project Contact (Name and Phone Number):
Darren Renne 804.965.9000

Samplers:
David Copen & John Spangler

Lab Contact:
~~Walt Roudebush~~
~~616.975.4561~~

AIRBILL No:

Courier:
Fed Ex

REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)

Field Sample ID	Date	Time	T.A.T. (Box #4)	Composite	Grab	Matrix Type (See Box #1)	Tag Color / Preservative (See Box #2)	Filtered or Unfiltered (See Box#3)	# of Container	ANALYSES: Volatile Organic Compounds (8260B)	Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	Pesticides (8081A)	Polychlorinated Biphenyl (8082)	Explosives (8330, 8332, 8332M)	Dioxin/Furan (8290)	TAL Metals, Hg (6010B, 7471A)	Perchlorate (314.0)	TCLP (FULL)	Chemical Oxygen Demand (410.4)	Cyanide (9012A)	Herbicides (8151A)	Paint Filter (9095B)	pH (9040B)
54GW61	8.24.04	1245	S		X	9	O	U	1									X					
54GW60	8.24.04	1130	S		X	9	O	U	1									X					
54GW58	8.24.04	1100	S		X	9	O	U	1									X					

Custody Seals Intact
Received Temp. 5°C
1 cooler / FEDEX
T#839872066658
AOF 08-25-04

Box #1: 1. Soil; 2. Sediment; 3. Surface Water; 4. Possible Fill; 5. Rinsate; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other Ground H_2O

Box #2: Y. Yellow / HCl; S. Salmon / None; G. Green / None; LB. Lt. Blue / NaOH; R. Red / HNO_3; W. White / None; M. Manila / None; DB. Dark Blue / H_2SO_4; LY. Light Yellow / None; RW. Red & White Stripes / HNO_3; E. En Core / None; O. Other 250mL plastic

Box #3: F. Filtered; U. Unfiltered

Box #4: R. Rush - 3 Day; S. Standard - 28 Day; T. Timely - 14 Day; O. Other _____

1. Relinquished by:	Date time	2. Relinquished by:	Date Time	Additional Comments:
David Copen	8.24.04 1745			
1. Received by:	Date time	2. Received by:	Date Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement.
Andrew D. Flores	08-25-04 09:00			

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

STL KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Client: RAAP **Project:** RFAAP **Lot Number:** 144H250160

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ **1a** Do not match COC ☐ **1b** Incomplete information ☐ **1c** Marking smeared ☐ **1d** Label torn ☐ **1e** No label ☐ **1f** COC not received ☐ **1g** Other:	
2. Is the cooler temperature within limits? (North Carolina, 1668, 1613B: 0-4°C; VOST: 10°C) (Cooler temp should be used only if no temp blank.)	✓			☐ **2a** Temp Blank = _____ ☐ **2b** Cooler Temp = _____	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ **3a** Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?	✓			☐ **4a** Not present ☐ **4b** Not intact ☐ **4c** Other:	
5. Were all of the samples listed on the COC received?	✓			☐ **5a** Samples received-not on COC ☐ **5b** Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ **6a** Leaking ☐ **6b** Broken	
7. Were VOA samples received without headspace?			✓	☐ **7a** Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ **8a** Improper container	
9. Did you check for residual chlorine, if necessary?			✓		
10. Were samples received with ≥½ HT remaining?	✓		ADF 08/25/04 ✓	☐ **10a** Holding time expired ☐ **10b** <½ HT left	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For SOG water samples (1613B, 1668A, 8290, LR PAHs), do samples have visible solids present?			✓	If yes, was SOG notified? _____	
13. Are the coolers intact?	✓			☐ **13a** Leaking ☐ **13b** Other:	
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ **14a** Not relinquished by client	
15. Are tests/parameters listed for each sample?	✓			☐ **15a** Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ **15a** Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ **15a** Incomplete information	
18. Is the client and project name/# identified?	✓			☐ **15a** Incomplete information	
19. Was the sampler identified on the COC?	✓			☐ **15a** Incomplete information	

Quote #: 57695 PM Instructions: _____

Sample Receiving Associate: Andrew D. Flores Date: 08-25-04

QA026R14.doc, 7/12/04

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

APPENDIX H.3
Additional Investigations and Quarterly Groundwater Monitoring
2006-2007

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-29 **Fraction:** Explosives_& Metals

Lab: TriMatrix **Project Name** Radford SWMU 54

Reviewer: RA **Date:** January 16, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: For the explosives analyses, the matrix spike duplicate analyzed for sample NR-SED-5 displayed a percent recovery (%R) less than the lower control limit of 75% for 2-amino-4,6-dinitrotoluene at 73%. The associated parent sample result was non-detect and was flagged "UJ,m". The matrix spike pair analyzed for sample NR-SED-14 displayed %Rs greater than the upper control limit of 125% for 2-amino-4,6-dinitrotoluene at 182% and 185%, respectively. The associated parent sample result was non-detect and no data qualifying action was necessary.

For the metals analyses by method 6010B, the method blanks displayed positive detections for iron, chromium, manganese, and zinc. Positive associated field sample results less than five times the method blank contaminations were flagged "B,p". The continuing calibration blanks displayed positive detections for iron and chromium; and negative detections for barium and sodium. The associated field sample results were greater than five times the absolute value of the blank concentrations, and no data qualifying action was necessary.

The matrix spike pair analyzed for sample NR-SED-14 displayed %Rs and relative percent differences greater than the upper control limits for calcium (251%/48%) and magnesium (196%/27%). The associated parent sample results were positive and were flagged "K,m".

The serial dilution analyzed for sample NR-SED-14 displayed a percent difference greater than the control limit of 10% for iron at 106.5%. The associated field sample results were positive and were flagged "J,s", unless previously flagged for method blank contamination.

Field Sample and Assigned Laboratory Sample ID Summary

For the samples received, a field sample to laboratory sample ID cross-reference table follows.

Field Sample Name	Sample Matrix	Laboratory Sample ID	Date Sampled	Date Received
NR-SED-22	Soil	0611283-01	11/08/06	11/09/06
NR-SED-23	Soil	0611283-02	11/08/06	11/09/06
NR-SED-21	Soil	0611283-03	11/08/06	11/09/06
NR-SED-20	Soil	0611283-04	11/08/06	11/09/06
NR-SED-19	Soil	0611283-05	11/08/06	11/09/06
NR-SED-18	Soil	0611283-06	11/08/06	11/09/06
NR-SED-17	Soil	0611283-07	11/08/06	11/09/06
NR-SED-16	Soil	0611283-08	11/08/06	11/09/06
NR-SED-15	Soil	0611283-09	11/08/06	11/09/06
DUP-1	Soil	0611283-10	11/08/06	11/09/06
NR-SED-14	Soil	0611283-11	11/08/06	11/09/06
NR-SED-13	Soil	0611283-12	11/08/06	11/09/06
NR-SED-12	Soil	0611283-13	11/08/06	11/09/06
NR-SED-11	Soil	0611283-14	11/08/06	11/09/06
NR-SED-10	Soil	0611283-15	11/08/06	11/09/06
NR-SED-9	Soil	0611283-16	11/08/06	11/09/06
NR-SED-8	Soil	0611283-17	11/08/06	11/09/06
DUP-2	Soil	0611283-18	11/08/06	11/09/06
NR-SED-6	Soil	0611283-19	11/08/06	11/09/06
NR-SED-5	Soil	0611283-20	11/08/06	11/09/06
NR-SED-3	Soil	0611283-21	11/08/06	11/09/06
NR-SED-2	Soil	0611283-22	11/08/06	11/09/06
NR-SED-1	Soil	0611283-23	11/08/06	11/09/06
NR-SED-4	Soil	0611283-24	11/08/06	11/09/06
NR-SED-7	Soil	0611283-25	11/08/06	11/09/06
DUP-3	Soil	0611283-26	11/08/06	11/09/06

This report shall not be reproduced except in full, without written authorization of TriMatrix Laboratories, Inc.
Individual sample results relate only to the sample tested.

SAMPLE ID SUMMARY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-29

Client: URS Group, Inc.

Project: RFAAP SWMU 54 RFI/CMS

Client Sample Id:	Lab Sample Id:
NR-SED-22	0611283-01
NR-SED-23	0611283-02
NR-SED-21	0611283-03
NR-SED-20	0611283-04
NR-SED-19	0611283-05
NR-SED-18	0611283-06
NR-SED-17	0611283-07
NR-SED-16	0611283-08
NR-SED-15	0611283-09
DUP-1	0611283-10
NR-SED-14	0611283-11
NR-SED-13	0611283-12
NR-SED-12	0611283-13
NR-SED-11	0611283-14
NR-SED-10	0611283-15
NR-SED-10	0611283-15RE1
NR-SED-9	0611283-16
NR-SED-8	0611283-17
NR-SED-8	0611283-17RE1
DUP-2	0611283-18
NR-SED-6	0611283-19
NR-SED-5	0611283-20
NR-SED-3	0611283-21
NR-SED-2	0611283-22
NR-SED-1	0611283-23
NR-SED-4	0611283-24
NR-SED-7	0611283-25
DUP-3	0611283-26

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-22

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-01 File ID: EXa014-0

Sampled: 11/08/06 08:25 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 00:37

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112167 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.05	82	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-23

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29 4MD
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Matrix: Sediment
Laboratory ID: 0611283-02
File ID: EXa015-0
Sampled: 11/08/06 09:05
Prepared: 11/16/06 07:48
Analyzed: 11/21/06 01:19
Solids:
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0613520
Sequence: 6112167
Calibration: 6K21021
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tri azine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitram ine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3, 5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.17	87	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-21

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-03 File ID: EXa016-0

Sampled: 11/08/06 09:25 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 02:01

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112167 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.02	81	57 - 139	

* Values outside of QC limits

00110

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-20

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-04 File ID: EXa017-0

Sampled: 11/08/06 09:50 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 02:42

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112167 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.98	79	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-19

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-05 File ID: EXa018-0

Sampled: 11/08/06 10:10 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 03:24

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112167 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.38	95	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-18

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-06 File ID: EXa019-0

Sampled: 11/08/06 10:20 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 04:06

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112167 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.20	88	57 - 139	

* Values outside of QC limits

00119

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-17

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-07 File ID: EXa020-0

Sampled: 11/08/06 10:35 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 04:48

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112167 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.33	93	57 - 139	

* Values outside of QC limits

00122

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-16

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-08 File ID: EXa021-0

Sampled: 11/08/06 10:50 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 05:30

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112167 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.70	108	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-15

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-09 File ID: data003-0

Sampled: 11/08/06 11:00 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 14:34

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.15	86	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-10 File ID: data004-0

Sampled: 11/08/06 00:00 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 15:16

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.40	96	57 - 139	

* Values outside of QC limits

00131

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-11 File ID: data005-0

Sampled: 11/08/06 11:25 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 15:58

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.13	85	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-13

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-12 File ID: data006-0

Sampled: 11/08/06 11:50 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 16:39

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.87	75	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-12

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-13 File ID: data007-0

Sampled: 11/08/06 12:00 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 17:21

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.83	73	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-11

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-14 File ID: data008-0

Sampled: 11/08/06 12:35 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 18:03

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.39	95	57 - 139	

* Values outside of QC limits

00143

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-10

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-15 File ID: data009-0

Sampled: 11/08/06 12:50 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 18:46

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	0.38	2.5	0.051	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.35	94	57 - 139	

* Values outside of QC limits

00146

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-9

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-16 File ID: data010-0

Sampled: 11/08/06 13:05 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 19:28

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.20	88	57 - 139	

* Values outside of QC limits

00149

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-8

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-17 File ID: data011-0

Sampled: 11/08/06 13:25 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 20:09

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	1.4	2.5	0.073	J
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.79	71	57 - 139	

* Values outside of QC limits

00152

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-18 File ID: data012-0

Sampled: 11/08/06 00:00 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 20:51

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.14	85	57 - 139	

* Values outside of QC limits

00155

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-19 File ID: data014-0

Sampled: 11/08/06 13:40 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 22:15

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.75	70	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-20 File ID: data020-0

Sampled: 11/08/06 13:50 Prepared: 11/16/06 07:49 Analyzed: 11/22/06 02:26

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613521 val flag Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene UJ, M	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.61	64	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-21 File ID: data015-0

Sampled: 11/08/06 14:05 Prepared: 11/16/06 07:48 Analyzed: 11/21/06 22:57

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613520 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.17	87	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-22 File ID: data021-0

Sampled: 11/08/06 14:25 Prepared: 11/16/06 07:49 Analyzed: 11/22/06 03:07

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613521 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.90	76	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-23 File ID: data022-0

Sampled: 11/08/06 14:35 Prepared: 11/16/06 07:49 Analyzed: 11/22/06 03:49

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613521 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No. #	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.76	70	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-24 File ID: data023-0

Sampled: 11/08/06 14:50 Prepared: 11/16/06 07:49 Analyzed: 11/22/06 04:31

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613521 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.98	79	57 - 139	

* Values outside of QC limits

00173

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SED-7

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-25 File ID: data025-0

Sampled: 11/08/06 15:00 Prepared: 11/16/06 07:49 Analyzed: 11/22/06 05:55

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613521 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.21	88	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-29 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Sediment Laboratory ID: 0611283-26 File ID: data026-0

Sampled: 11/08/06 00:00 Prepared: 11/16/06 07:49 Analyzed: 11/22/06 06:36

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0613521 Sequence: 6112204 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.77	71	57 - 139	

* Values outside of QC limits

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-22

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 08:25
Solids: 0.00
Laboratory ID: 0611283-01 Val. Flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	14000	mg/kg dry wt.	1	10	1.6		11/17/06 09:42
7440-39-3	Barium, Total	170	mg/kg dry wt.	1	1.0	0.10		11/17/06 09:42
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.016		11/17/06 09:42
7440-43-9	Cadmium, Total	1.9	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 09:42
7440-70-2	Calcium, Total	10000	mg/kg dry wt.	1	50	10		11/17/06 09:42
7440-47-3	Chromium, Total	24	mg/kg dry wt.	1	5.0	0.57		11/17/06 09:42
7440-48-4	Cobalt, Total	13	mg/kg dry wt.	1	2.0	0.35		11/17/06 09:42
7439-89-6	Iron, Total J,S	39000	mg/kg dry wt.	1	10	0.46		11/17/06 09:42
7439-95-4	Magnesium, Total	7600	mg/kg dry wt.	1	50	3.4		11/17/06 09:42
7439-96-5	Manganese, Total	1900	mg/kg dry wt.	1	1.0	0.14		11/17/06 09:42
7440-09-7	Potassium, Total	1400	mg/kg dry wt.	1	50	7.5		11/17/06 09:42
7440-23-5	Sodium, Total	21	mg/kg dry wt.	1	100	19	J	11/17/06 09:42
7440-66-6	Zinc, Total	550	mg/kg dry wt.	1	5.0	0.85		11/17/06 09:42

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-23

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:05
Solids: 0.00
Laboratory ID: 0611283-02 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	19000	mg/kg dry wt.	1	10	1.6		11/17/06 09:47
7440-39-3	Barium, Total	180	mg/kg dry wt.	1	1.0	0.10		11/17/06 09:47
7440-41-7	Beryllium, Total	1.2	mg/kg dry wt.	1	1.0	0.016		11/17/06 09:47
7440-43-9	Cadmium, Total	2.2	mg/kg dry wt.	1	2.0	0.50		11/17/06 09:47
7440-70-2	Calcium, Total	3700	mg/kg dry wt.	1	50	10		11/17/06 09:47
7440-47-3	Chromium, Total	24	mg/kg dry wt.	1	5.0	0.57		11/17/06 09:47
7440-48-4	Cobalt, Total	15	mg/kg dry wt.	1	2.0	0.35		11/17/06 09:47
7439-89-6	Iron, Total J1S	36000	mg/kg dry wt.	1	10	0.46		11/17/06 09:47
7439-95-4	Magnesium, Total	4400	mg/kg dry wt.	1	50	3.4		11/17/06 09:47
7439-96-5	Manganese, Total	1200	mg/kg dry wt.	1	1.0	0.14		11/17/06 09:47
7440-09-7	Potassium, Total	1600	mg/kg dry wt.	1	50	7.5		11/17/06 09:47
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 09:47
7440-66-6	Zinc, Total	660	mg/kg dry wt.	1	5.0	0.85		11/17/06 09:47

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-21

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:25
Solids: 0.00
Laboratory ID: 0611283-03 Val. Flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	18000	mg/kg dry wt.	1	10	1.6		11/17/06 09:52
7440-39-3	Barium, Total	180	mg/kg dry wt.	1	1.0	0.10		11/17/06 09:52
7440-41-7	Beryllium, Total	1.6	mg/kg dry wt.	1	1.0	0.016		11/17/06 09:52
7440-43-9	Cadmium, Total	2.5	mg/kg dry wt.	1	2.0	0.50		11/17/06 09:52
7440-70-2	Calcium, Total	11000	mg/kg dry wt.	1	50	10		11/17/06 09:52
7440-48-4	Cobalt, Total	15	mg/kg dry wt.	1	2.0	0.35		11/17/06 09:52
7439-89-6	Iron, Total B|P	74000	mg/kg dry wt.	1000	10000	460		11/17/06 13:30
7439-95-4	Magnesium, Total	7400	mg/kg dry wt.	1	50	3.4		11/17/06 09:52
7439-96-5	Manganese, Total	2300	mg/kg dry wt.	1	1.0	0.14		11/17/06 09:52
7440-09-7	Potassium, Total	1300	mg/kg dry wt.	1	50	7.5		11/17/06 09:52
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 09:52
7440-66-6	Zinc, Total	940	mg/kg dry wt.	1	5.0	0.85		11/17/06 09:52

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-21

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:25
Solids: 0.00
Laboratory ID: 0611283-03

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	20	mg/kg dry wt.	1	5.0	0.57		11/22/06 10:55

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-20

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:50
Solids: 0.00
Laboratory ID: 0611283-04

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	7300	mg/kg dry wt.	1	10	1.6		11/17/06 09:57
7440-39-3	Barium, Total	84	mg/kg dry wt.	1	1.0	0.10		11/17/06 09:57
7440-41-7	Beryllium, Total	0.56	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 09:57
7440-43-9	Cadmium, Total	1.0	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 09:57
7440-70-2	Calcium, Total	2100	mg/kg dry wt.	1	50	10		11/17/06 09:57
7440-48-4	Cobalt, Total	7.4	mg/kg dry wt.	1	2.0	0.35		11/17/06 09:57
7439-89-6	Iron, Total JLS	27000	mg/kg dry wt.	1	10	0.46		11/17/06 09:57
7439-95-4	Magnesium, Total	2600	mg/kg dry wt.	1	50	3.4		11/17/06 09:57
7439-96-5	Manganese, Total	730	mg/kg dry wt.	1	1.0	0.14		11/17/06 09:57
7440-09-7	Potassium, Total	1000	mg/kg dry wt.	1	50	7.5		11/17/06 09:57
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 09:57
7440-66-6	Zinc, Total	350	mg/kg dry wt.	1	5.0	0.85		11/17/06 09:57

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-20

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:50
Solids: 0.00
Laboratory ID: 0611283-04

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	14	mg/kg dry wt.	1	5.0	0.57		11/22/06 11:00

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-19

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:10
Solids: 0.00
Laboratory ID: 0611283-05

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	4500	mg/kg dry wt.	1	10	1.6		11/17/06 10:02
7440-39-3	Barium, Total	44	mg/kg dry wt.	1	1.0	0.10		11/17/06 10:02
7440-41-7	Beryllium, Total	0.52	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 10:02
7440-43-9	Cadmium, Total	0.86	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 10:02
7440-70-2	Calcium, Total	1000	mg/kg dry wt.	1	50	10		11/17/06 10:02
7440-48-4	Cobalt, Total	4.6	mg/kg dry wt.	1	2.0	0.35		11/17/06 10:02
7439-89-6	Iron, Total J,S	29000	mg/kg dry wt.	1	10	0.46		11/17/06 10:02
7439-95-4	Magnesium, Total	1400	mg/kg dry wt.	1	50	3.4		11/17/06 10:02
7439-96-5	Manganese, Total	450	mg/kg dry wt.	1	1.0	0.14		11/17/06 10:02
7440-09-7	Potassium, Total	620	mg/kg dry wt.	1	50	7.5		11/17/06 10:02
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 10:02
7440-66-6	Zinc, Total	370	mg/kg dry wt.	1	5.0	0.85		11/17/06 10:02

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-19

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:10
Solids: 0.00
Laboratory ID: 0611283-05

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	13	mg/kg dry wt.	1	5.0	0.57		11/22/06 11:05

60354

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-18

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:20
Solids: 0.00
Laboratory ID: 0611283-06

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	10000	mg/kg dry wt.	1	10	1.6		11/17/06 10:07
7440-39-3	Barium, Total	110	mg/kg dry wt.	1	1.0	0.10		11/17/06 10:07
7440-41-7	Beryllium, Total	0.71	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 10:07
7440-43-9	Cadmium, Total	1.2	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 10:07
7440-70-2	Calcium, Total	2900	mg/kg dry wt.	1	50	10		11/17/06 10:07
7440-47-3	Chromium, Total	24	mg/kg dry wt.	1	5.0	0.57		11/17/06 10:07
7440-48-4	Cobalt, Total	9.5	mg/kg dry wt.	1	2.0	0.35		11/17/06 10:07
7439-89-6	Iron, Total J, S	28000	mg/kg dry wt.	1	10	0.46		11/17/06 10:07
7439-95-4	Magnesium, Total	3600	mg/kg dry wt.	1	50	3.4		11/17/06 10:07
7439-96-5	Manganese, Total	550	mg/kg dry wt.	1	1.0	0.14		11/17/06 10:07
7440-09-7	Potassium, Total	1600	mg/kg dry wt.	1	50	7.5		11/17/06 10:07
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 10:07
7440-66-6	Zinc, Total	370	mg/kg dry wt.	1	5.0	0.85		11/17/06 10:07

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-17

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:35
Solids: 0.00
Laboratory ID: 0611283-07

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	11000	mg/kg dry wt.	1	10	1.6		11/17/06 10:12
7440-39-3	Barium, Total	110	mg/kg dry wt.	1	1.0	0.10		11/17/06 10:12
7440-41-7	Beryllium, Total	0.76	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 10:12
7440-43-9	Cadmium, Total	1.2	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 10:12
7440-70-2	Calcium, Total	2600	mg/kg dry wt.	1	50	10		11/17/06 10:12
7440-48-4	Cobalt, Total	9.2	mg/kg dry wt.	1	2.0	0.35		11/17/06 10:12
7439-89-6	Iron, Total J,S	31000	mg/kg dry wt.	1	10	0.46		11/17/06 10:12
7439-95-4	Magnesium, Total	2800	mg/kg dry wt.	1	50	3.4		11/17/06 10:12
7439-96-5	Manganese, Total	470	mg/kg dry wt.	1	1.0	0.14		11/17/06 10:12
7440-09-7	Potassium, Total	1200	mg/kg dry wt.	1	50	7.5		11/17/06 10:12
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 10:12
7440-66-6	Zinc, Total	450	mg/kg dry wt.	1	5.0	0.85		11/17/06 10:12

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-17

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:35
Solids: 0.00
Laboratory ID: 0611283-07

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	17	mg/kg dry wt.	1	5.0	0.57		11/22/06 11:20

00357

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-16

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:50
Solids: 0.00
Laboratory ID: 0611283-08 Val Flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	21000	mg/kg dry wt.	1	10	1.6		11/17/06 10:17
7440-39-3	Barium, Total	220	mg/kg dry wt.	1	1.0	0.10		11/17/06 10:17
7440-41-7	Beryllium, Total	2.2	mg/kg dry wt.	1	1.0	0.016		11/17/06 10:17
7440-43-9	Cadmium, Total	3.6	mg/kg dry wt.	1	2.0	0.50		11/17/06 10:17
7440-70-2	Calcium, Total	3400	mg/kg dry wt.	1	50	10		11/17/06 10:17
7440-48-4	Cobalt, Total	16	mg/kg dry wt.	1	2.0	0.35		11/17/06 10:17
7439-89-6	Iron, Total B1P	84000	mg/kg dry wt.	1000	10000	460		11/17/06 13:35
7439-95-4	Magnesium, Total	2900	mg/kg dry wt.	1	50	3.4		11/17/06 10:17
7439-96-5	Manganese, Total	4400	mg/kg dry wt.	1	1.0	0.14		11/17/06 10:17
7440-09-7	Potassium, Total	1400	mg/kg dry wt.	1	50	7.5		11/17/06 10:17
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 10:17
7440-66-6	Zinc, Total	1700	mg/kg dry wt.	1	5.0	0.85		11/17/06 10:17

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-16

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:50
Solids: 0.00
Laboratory ID: 0611283-08

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	21	mg/kg dry wt.	1	5.0	0.57		11/22/06 11:25

00359

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-15

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:00
Solids: 0.00
Laboratory ID: 0611283-09

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	12000	mg/kg dry wt.	1	10	1.6		11/17/06 10:32
7440-39-3	Barium, Total	140	mg/kg dry wt.	1	1.0	0.10		11/17/06 10:32
7440-41-7	Beryllium, Total	0.97	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 10:32
7440-43-9	Cadmium, Total	1.6	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 10:32
7440-70-2	Calcium, Total	2200	mg/kg dry wt.	1	50	10		11/17/06 10:32
7440-48-4	Cobalt, Total	10	mg/kg dry wt.	1	2.0	0.35		11/17/06 10:32
7439-89-6	Iron, Total J/S	41000	mg/kg dry wt.	1	10	0.46		11/17/06 10:32
7439-95-4	Magnesium, Total	3100	mg/kg dry wt.	1	50	3.4		11/17/06 10:32
7439-96-5	Manganese, Total	1500	mg/kg dry wt.	1	1.0	0.14		11/17/06 10:32
7440-09-7	Potassium, Total	1400	mg/kg dry wt.	1	50	7.5		11/17/06 10:32
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 10:32
7440-66-6	Zinc, Total	750	mg/kg dry wt.	1	5.0	0.85		11/17/06 10:32

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-15

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:00
Solids: 0.00
Laboratory ID: 0611283-09

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	18	mg/kg dry wt.	1	5.0	0.57		11/22/06 11:30

00361

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-10

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	9400	mg/kg dry wt.	1	10	1.6		11/17/06 10:37
7440-39-3	Barium, Total	110	mg/kg dry wt.	1	1.0	0.10		11/17/06 10:37
7440-41-7	Beryllium, Total	0.73	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 10:37
7440-43-9	Cadmium, Total	1.2	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 10:37
7440-70-2	Calcium, Total	2400	mg/kg dry wt.	1	50	10		11/17/06 10:37
7440-48-4	Cobalt, Total	8.4	mg/kg dry wt.	1	2.0	0.35		11/17/06 10:37
7439-89-6	Iron, Total J,S	32000	mg/kg dry wt.	1	10	0.46		11/17/06 10:37
7439-95-4	Magnesium, Total	2800	mg/kg dry wt.	1	50	3.4		11/17/06 10:37
7439-96-5	Manganese, Total	700	mg/kg dry wt.	1	1.0	0.14		11/17/06 10:37
7440-09-7	Potassium, Total	1100	mg/kg dry wt.	1	50	7.5		11/17/06 10:37
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 10:37
7440-66-6	Zinc, Total	470	mg/kg dry wt.	1	5.0	0.85		11/17/06 10:37

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-10

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	19	mg/kg dry wt.	1	5.0	0.57		11/22/06 11:35

00363

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:25
Solids: 0.00
Laboratory ID: 0611283-11 Val flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	7200	mg/kg dry wt.	100	1000	160		11/17/06 13:54
7440-39-3	Barium, Total	75	mg/kg dry wt.	1	1.0	0.10		11/17/06 10:42
7440-41-7	Beryllium, Total	0.61	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 10:42
7440-43-9	Cadmium, Total	0.95	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 10:42
7440-70-2	Calcium, Total Kim	1500	mg/kg dry wt.	1	50	10		11/17/06 10:42
7440-48-4	Cobalt, Total	5.5	mg/kg dry wt.	1	2.0	0.35		11/17/06 10:42
7439-89-6	Iron, Total BIP	35000	mg/kg dry wt.	500	5000	230		11/17/06 13:40
7439-95-4	Magnesium, Total Kim	1900	mg/kg dry wt.	1	50	3.4		11/17/06 10:42
7439-96-5	Manganese, Total	330	mg/kg dry wt.	5	5.0	0.70		11/17/06 14:08
7440-09-7	Potassium, Total	870	mg/kg dry wt.	1	50	7.5		11/17/06 10:42
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 10:42
7440-66-6	Zinc, Total	340	mg/kg dry wt.	5	25	4.3		11/17/06 14:08

00354

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:25
Solids: 0.00
Laboratory ID: 0611283-11

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	16	mg/kg dry wt.	1	5.0	0.57		11/22/06 11:41

00365

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:50
Solids: 0.00
Laboratory ID: 0611283-12

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	9300	mg/kg dry wt.	1	10	1.6		11/17/06 11:06
7440-39-3	Barium, Total	91	mg/kg dry wt.	1	1.0	0.10		11/17/06 11:06
7440-41-7	Beryllium, Total	0.77	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 11:06
7440-43-9	Cadmium, Total	1.1	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 11:06
7440-70-2	Calcium, Total	2200	mg/kg dry wt.	1	50	10		11/17/06 11:06
7440-48-4	Cobalt, Total	8.4	mg/kg dry wt.	1	2.0	0.35		11/17/06 11:06
7439-89-6	Iron, Total J, S	28000	mg/kg dry wt.	1	10	0.46		11/17/06 11:06
7439-95-4	Magnesium, Total	2600	mg/kg dry wt.	1	50	3.4		11/17/06 11:06
7439-96-5	Manganese, Total	470	mg/kg dry wt.	1	1.0	0.14		11/17/06 11:06
7440-09-7	Potassium, Total	1200	mg/kg dry wt.	1	50	7.5		11/17/06 11:06
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 11:06
7440-66-6	Zinc, Total	400	mg/kg dry wt.	1	5.0	0.85		11/17/06 11:06

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:50
Solids: 0.00
Laboratory ID: 0611283-12

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	18	mg/kg dry wt.	1	5.0	0.57		11/22/06 12:16

00367

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-12

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:00
Solids: 0.00
Laboratory ID: 0611283-13

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	7200	mg/kg dry wt.	1	10	1.6		11/17/06 11:12
7440-39-3	Barium, Total	72	mg/kg dry wt.	1	1.0	0.10		11/17/06 11:12
7440-41-7	Beryllium, Total	0.52	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 11:12
7440-43-9	Cadmium, Total	1.0	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 11:12
7440-70-2	Calcium, Total	1600	mg/kg dry wt.	1	50	10		11/17/06 11:12
7440-48-4	Cobalt, Total	6.2	mg/kg dry wt.	1	2.0	0.35		11/17/06 11:12
7439-89-6	Iron, Total J,S	30000	mg/kg dry wt.	1	10	0.46		11/17/06 11:12
7439-95-4	Magnesium, Total	2200	mg/kg dry wt.	1	50	3.4		11/17/06 11:12
7439-96-5	Manganese, Total	640	mg/kg dry wt.	1	1.0	0.14		11/17/06 11:12
7440-09-7	Potassium, Total	1000	mg/kg dry wt.	1	50	7.5		11/17/06 11:12
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 11:12
7440-66-6	Zinc, Total	390	mg/kg dry wt.	1	5.0	0.85		11/17/06 11:12

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-12

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:00
Solids: 0.00
Laboratory ID: 0611283-13

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	15	mg/kg dry wt.	1	5.0	0.57		11/22/06 12:21

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-11

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:35
Solids: 0.00
Laboratory ID: 0611283-14

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	11000	mg/kg dry wt.	1	10	1.6		11/17/06 11:17
7440-39-3	Barium, Total	120	mg/kg dry wt.	1	1.0	0.10		11/17/06 11:17
7440-41-7	Beryllium, Total	0.77	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 11:17
7440-43-9	Cadmium, Total	1.2	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 11:17
7440-70-2	Calcium, Total	2400	mg/kg dry wt.	1	50	10		11/17/06 11:17
7440-48-4	Cobalt, Total	9.5	mg/kg dry wt.	1	2.0	0.35		11/17/06 11:17
7439-89-6	Iron, Total J,S	29000	mg/kg dry wt.	1	10	0.46		11/17/06 11:17
7439-95-4	Magnesium, Total	3400	mg/kg dry wt.	1	50	3.4		11/17/06 11:17
7439-96-5	Manganese, Total	900	mg/kg dry wt.	1	1.0	0.14		11/17/06 11:17
7440-09-7	Potassium, Total	1600	mg/kg dry wt.	1	50	7.5		11/17/06 11:17
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 11:17
7440-66-6	Zinc, Total	390	mg/kg dry wt.	1	5.0	0.85		11/17/06 11:17

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-11

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:35
Solids: 0.00
Laboratory ID: 0611283-14

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	21	mg/kg dry wt.	1	5.0	0.57		11/22/06 12:26

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-10

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:50
Solids: 0.00
Laboratory ID: 0611283-15

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	22000	mg/kg dry wt.	1	10	1.6		11/17/06 11:31
7440-39-3	Barium, Total	180	mg/kg dry wt.	1	1.0	0.10		11/17/06 11:31
7440-41-7	Beryllium, Total	1.4	mg/kg dry wt.	1	1.0	0.016		11/17/06 11:31
7440-43-9	Cadmium, Total	2.8	mg/kg dry wt.	1	2.0	0.50		11/17/06 11:31
7440-70-2	Calcium, Total	1600	mg/kg dry wt.	1	50	10		11/17/06 11:31
7440-47-3	Chromium, Total	35	mg/kg dry wt.	1	5.0	0.57		11/17/06 11:31
7440-48-4	Cobalt, Total	17	mg/kg dry wt.	1	2.0	0.35		11/17/06 11:31
7439-89-6	Iron, Total JTS	43000	mg/kg dry wt.	1	10	0.46		11/17/06 11:31
7439-95-4	Magnesium, Total	3600	mg/kg dry wt.	1	50	3.4		11/17/06 11:31
7439-96-5	Manganese, Total	1600	mg/kg dry wt.	1	1.0	0.14		11/17/06 11:31
7440-09-7	Potassium, Total	1800	mg/kg dry wt.	1	50	7.5		11/17/06 11:31
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 11:31
7440-66-6	Zinc, Total	800	mg/kg dry wt.	1	5.0	0.85		11/17/06 11:31

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-9

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:05
Solids: 0.00
Laboratory ID: 0611283-16 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	7900	mg/kg dry wt.	1	10	1.6		11/17/06 11:36
7440-39-3	Barium, Total	100	mg/kg dry wt.	1	1.0	0.10		11/17/06 11:36
7440-41-7	Beryllium, Total	0.92	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 11:36
7440-43-9	Cadmium, Total	1.6	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 11:36
7440-70-2	Calcium, Total	1600	mg/kg dry wt.	1	50	10		11/17/06 11:36
7440-48-4	Cobalt, Total	8.7	mg/kg dry wt.	1	2.0	0.35		11/17/06 11:36
7439-89-6	Iron, Total B,P	79000	mg/kg dry wt.	1000	10000	460		11/17/06 14:32
7439-95-4	Magnesium, Total	2000	mg/kg dry wt.	1	50	3.4		11/17/06 11:36
7439-96-5	Manganese, Total	800	mg/kg dry wt.	1	1.0	0.14		11/17/06 11:36
7440-09-7	Potassium, Total	850	mg/kg dry wt.	1	50	7.5		11/17/06 11:36
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 11:36
7440-66-6	Zinc, Total	550	mg/kg dry wt.	1	5.0	0.85		11/17/06 11:36

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-9

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:05
Solids: 0.00
Laboratory ID: 0611283-16

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	18	mg/kg dry wt.	1	5.0	0.57		11/22/06 12:31

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-8

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:25
Solids: 0.00
Laboratory ID: 0611283-17

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	6600	mg/kg dry wt.	1	10	1.6		11/17/06 11:41
7440-39-3	Barium, Total	81	mg/kg dry wt.	1	1.0	0.10		11/17/06 11:41
7440-41-7	Beryllium, Total	0.58	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 11:41
7440-43-9	Cadmium, Total	0.74	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 11:41
7440-70-2	Calcium, Total	4700	mg/kg dry wt.	1	50	10		11/17/06 11:41
7440-48-4	Cobalt, Total	7.4	mg/kg dry wt.	1	2.0	0.35		11/17/06 11:41
7439-89-6	Iron, Total J,S	23000	mg/kg dry wt.	1	10	0.46		11/17/06 11:41
7439-95-4	Magnesium, Total	3400	mg/kg dry wt.	1	50	3.4		11/17/06 11:41
7439-96-5	Manganese, Total	730	mg/kg dry wt.	1	1.0	0.14		11/17/06 11:41
7440-09-7	Potassium, Total	1000	mg/kg dry wt.	1	50	7.5		11/17/06 11:41
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 11:41
7440-66-6	Zinc, Total	270	mg/kg dry wt.	1	5.0	0.85		11/17/06 11:41

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-8

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:25
Solids: 0.00
Laboratory ID: 0611283-17

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	17	mg/kg dry wt.	1	5.0	0.57		11/22/06 12:35

00376

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-18

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	7600	mg/kg dry wt.	1	10	1.6		11/17/06 11:46
7440-39-3	Barium, Total	110	mg/kg dry wt.	1	1.0	0.10		11/17/06 11:46
7440-41-7	Beryllium, Total	0.55	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 11:46
7440-43-9	Cadmium, Total	1.3	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 11:46
7440-70-2	Calcium, Total	1700	mg/kg dry wt.	1	50	10		11/17/06 11:46
7440-48-4	Cobalt, Total	7.8	mg/kg dry wt.	1	2.0	0.35		11/17/06 11:46
7439-89-6	Iron, Total J,S	39000	mg/kg dry wt.	1	10	0.46		11/17/06 11:46
7439-95-4	Magnesium, Total	1800	mg/kg dry wt.	1	50	3.4		11/17/06 11:46
7439-96-5	Manganese, Total	1000	mg/kg dry wt.	1	1.0	0.14		11/17/06 11:46
7440-09-7	Potassium, Total	860	mg/kg dry wt.	1	50	7.5		11/17/06 11:46
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 11:46
7440-66-6	Zinc, Total	540	mg/kg dry wt.	1	5.0	0.85		11/17/06 11:46

00377

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-18

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:05
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	16	mg/kg dry wt.	1	5.0	0.57		11/22/06 12:40

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:40
Solids: 0.00
Laboratory ID: 0611283-19

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:10
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0613464

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	13000	mg/kg dry wt.	1	10	1.6		11/17/06 11:51
7440-39-3	Barium, Total	180	mg/kg dry wt.	1	1.0	0.10		11/17/06 11:51
7440-41-7	Beryllium, Total	0.87	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 11:51
7440-43-9	Cadmium, Total	1.4	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 11:51
7440-70-2	Calcium, Total	3000	mg/kg dry wt.	1	50	10		11/17/06 11:51
7440-47-3	Chromium, Total	26	mg/kg dry wt.	1	5.0	0.57		11/17/06 11:51
7440-48-4	Cobalt, Total	12	mg/kg dry wt.	1	2.0	0.35		11/17/06 11:51
7439-89-6	Iron, Total J1S	32000	mg/kg dry wt.	1	10	0.46		11/17/06 11:51
7439-95-4	Magnesium, Total	3500	mg/kg dry wt.	1	50	3.4		11/17/06 11:51
7439-96-5	Manganese, Total	1100	mg/kg dry wt.	1	1.0	0.14		11/17/06 11:51
7440-09-7	Potassium, Total	1700	mg/kg dry wt.	1	50	7.5		11/17/06 11:51
7440-23-5	Sodium, Total	69	mg/kg dry wt.	1	100	19	J	11/17/06 11:51
7440-66-6	Zinc, Total	350	mg/kg dry wt.	1	5.0	0.85		11/17/06 11:51

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:50
Solids: 0.00
Laboratory ID: 0611283-20

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613465

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	17000	mg/kg dry wt.	500	5000	790		11/17/06 14:37
7440-39-3	Barium, Total	540	mg/kg dry wt.	10	10	1.0		11/22/06 08:33
7440-41-7	Beryllium, Total	1.3	mg/kg dry wt.	1	1.0	0.016		11/17/06 12:06
7440-43-9	Cadmium, Total	1.3	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 12:06
7440-70-2	Calcium, Total	3100	mg/kg dry wt.	1	50	10		11/17/06 12:06
7440-48-4	Cobalt, Total	8.3	mg/kg dry wt.	1	2.0	0.35		11/17/06 12:06
7439-95-4	Magnesium, Total	2200	mg/kg dry wt.	1	50	3.4		11/17/06 12:06
7439-96-5	Manganese, Total	420	mg/kg dry wt.	5	5.0	0.70		11/17/06 14:52
7440-09-7	Potassium, Total	2600	mg/kg dry wt.	1	50	7.5		11/17/06 12:06
7440-23-5	Sodium, Total	260	mg/kg dry wt.	1	100	19		11/17/06 12:06
7440-66-6	Zinc, Total	250	mg/kg dry wt.	5	25	4.3		11/17/06 14:52

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:50
Solids: 0.00
Laboratory ID: 0611283-20

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:00
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613731

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	20	mg/kg dry wt.	1	5.0	0.57		11/22/06 13:04
7439-89-6	Iron, Total J/S	39000	mg/kg dry wt.	500	5000	230		11/22/06 09:07

00381

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:05
Solids: 0.00
Laboratory ID: 0611283-21

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613465

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	8200	mg/kg dry wt.	1	10	1.6		11/17/06 12:42
7440-39-3	Barium, Total	110	mg/kg dry wt.	1	1.0	0.10		11/17/06 12:42
7440-41-7	Beryllium, Total	0.56	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 12:42
7440-43-9	Cadmium, Total	1.0	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 12:42
7440-70-2	Calcium, Total	1100	mg/kg dry wt.	1	50	10		11/17/06 12:42
7440-48-4	Cobalt, Total	7.1	mg/kg dry wt.	1	2.0	0.35		11/17/06 12:42
7439-95-4	Magnesium, Total	1700	mg/kg dry wt.	1	50	3.4		11/17/06 12:42
7439-96-5	Manganese, Total	1400	mg/kg dry wt.	1	1.0	0.14		11/17/06 12:42
7440-09-7	Potassium, Total	820	mg/kg dry wt.	1	50	7.5		11/17/06 12:42
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 12:42
7440-66-6	Zinc, Total	420	mg/kg dry wt.	1	5.0	0.85		11/17/06 12:42

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:05
Solids: 0.00
Laboratory ID: 0611283-21

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:00
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0613731

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	21	mg/kg dry wt.	1	5.0	0.57		11/22/06 12:45
7439-89-6	Iron, Total J1S	39000	mg/kg dry wt.	10	100	4.6		11/22/06 09:41

00383

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:25
Solids: 0.00
Laboratory ID: 0611283-22

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0613465

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	5300	mg/kg dry wt.	1	10	1.6		11/17/06 12:47
7440-39-3	Barium, Total	62	mg/kg dry wt.	1	1.0	0.10		11/17/06 12:47
7440-41-7	Beryllium, Total	0.48	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 12:47
7440-43-9	Cadmium, Total	0.71	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 12:47
7440-70-2	Calcium, Total	910	mg/kg dry wt.	1	50	10		11/17/06 12:47
7440-48-4	Cobalt, Total	5.3	mg/kg dry wt.	1	2.0	0.35		11/17/06 12:47
7439-95-4	Magnesium, Total	1400	mg/kg dry wt.	1	50	3.4		11/17/06 12:47
7439-96-5	Manganese, Total	630	mg/kg dry wt.	1	1.0	0.14		11/17/06 12:47
7440-09-7	Potassium, Total	750	mg/kg dry wt.	1	50	7.5		11/17/06 12:47
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 12:47
7440-66-6	Zinc, Total	300	mg/kg dry wt.	1	5.0	0.85		11/17/06 12:47

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:25
Solids: 0.00
Laboratory ID: 0611283-22

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:00
Initial/Final: 0.5 g / 50 mL
QC Batch: 0613731

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-47-3	Chromium, Total	15	mg/kg dry wt.	1	5.0	0.57		11/22/06 12:50
7439-89-6	Iron, Total J1S	28000	mg/kg dry wt.	10	100	4.6		11/22/06 09:46

INORGANIC ANALYSIS DATA SHEET

USEPA-6010B

NR-SED-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:35
Solids: 0.00
Laboratory ID: 0611283-23

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0613465

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	9800	mg/kg dry wt.	1	10	1.6		11/17/06 12:52
7440-39-3	Barium, Total	94	mg/kg dry wt.	1	1.0	0.10		11/17/06 12:52
7440-41-7	Beryllium, Total	0.69	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 12:52
7440-43-9	Cadmium, Total	1.2	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 12:52
7440-70-2	Calcium, Total	1500	mg/kg dry wt.	1	50	10		11/17/06 12:52
7440-47-3	Chromium, Total	23	mg/kg dry wt.	1	5.0	0.57		11/17/06 12:52
7440-48-4	Cobalt, Total	8.6	mg/kg dry wt.	1	2.0	0.35		11/17/06 12:52
7439-95-4	Magnesium, Total	2300	mg/kg dry wt.	1	50	3.4		11/17/06 12:52
7439-96-5	Manganese, Total	930	mg/kg dry wt.	1	1.0	0.14		11/17/06 12:52
7440-09-7	Potassium, Total	1200	mg/kg dry wt.	1	50	7.5		11/17/06 12:52
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 12:52
7440-66-6	Zinc, Total	400	mg/kg dry wt.	1	5.0	0.85		11/17/06 12:52

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:35
Solids: 0.00
Laboratory ID: 0611283-23

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:00
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0613731

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-89-6	Iron, Total J S	32000	mg/kg dry wt.	10	100	4.6		11/22/06 09:51

00387

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-4

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:50
Solids: 0.00
Laboratory ID: 0611283-24

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0613465

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	30000	mg/kg dry wt.	1	10	1.6		11/17/06 12:58
7440-39-3	Barium, Total	240	mg/kg dry wt.	1	1.0	0.10		11/17/06 12:58
7440-41-7	Beryllium, Total	1.4	mg/kg dry wt.	1	1.0	0.016		11/17/06 12:58
7440-43-9	Cadmium, Total	1.4	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 12:58
7440-70-2	Calcium, Total	4700	mg/kg dry wt.	1	50	10		11/17/06 12:58
7440-47-3	Chromium, Total	44	mg/kg dry wt.	1	5.0	0.57		11/17/06 12:58
7440-48-4	Cobalt, Total	18	mg/kg dry wt.	1	2.0	0.35		11/17/06 12:58
7439-95-4	Magnesium, Total	6300	mg/kg dry wt.	1	50	3.4		11/17/06 12:58
7439-96-5	Manganese, Total	1200	mg/kg dry wt.	1	1.0	0.14		11/17/06 12:58
7440-09-7	Potassium, Total	3300	mg/kg dry wt.	1	50	7.5		11/17/06 12:58
7440-23-5	Sodium, Total	25	mg/kg dry wt.	1	100	19	J	11/17/06 12:58
7440-66-6	Zinc, Total	180	mg/kg dry wt.	1	5.0	0.85		11/17/06 12:58

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-4

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:50
Solids: 0.00
Laboratory ID: 0611283-24

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:00
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0613731

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-89-6	Iron, Total J,S	41000	mg/kg dry wt.	10	100	4.6		11/22/06 09:56

00389

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-7

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 15:00
Solids: 0.00
Laboratory ID: 0611283-25

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0613465

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	11000	mg/kg dry wt.	1	10	1.6		11/17/06 13:03
7440-39-3	Barium, Total	120	mg/kg dry wt.	1	1.0	0.10		11/17/06 13:03
7440-41-7	Beryllium, Total	0.75	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 13:03
7440-43-9	Cadmium, Total	1.3	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 13:03
7440-70-2	Calcium, Total	3200	mg/kg dry wt.	1	50	10		11/17/06 13:03
7440-47-3	Chromium, Total	23	mg/kg dry wt.	1	5.0	0.57		11/17/06 13:03
7440-48-4	Cobalt, Total	8.7	mg/kg dry wt.	1	2.0	0.35		11/17/06 13:03
7439-95-4	Magnesium, Total	3500	mg/kg dry wt.	1	50	3.4		11/17/06 13:03
7439-96-5	Manganese, Total	1100	mg/kg dry wt.	1	1.0	0.14		11/17/06 13:03
7440-09-7	Potassium, Total	1500	mg/kg dry wt.	1	50	7.5		11/17/06 13:03
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 13:03
7440-66-6	Zinc, Total	460	mg/kg dry wt.	1	5.0	0.85		11/17/06 13:03

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

NR-SED-7

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 15:00
Solids: 0.00
Laboratory ID: 0611283-25

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:00
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0613731

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-89-6	Iron, Total J/S	35000	mg/kg dry wt.	10	100	4.6		11/22/06 10:00

00391

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-26

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0613465

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	11000	mg/kg dry wt.	1	10	1.6		11/17/06 13:08
7440-39-3	Barium, Total	130	mg/kg dry wt.	1	1.0	0.10		11/17/06 13:08
7440-41-7	Beryllium, Total	0.87	mg/kg dry wt.	1	1.0	0.016	J	11/17/06 13:08
7440-43-9	Cadmium, Total	1.5	mg/kg dry wt.	1	2.0	0.50	J	11/17/06 13:08
7440-70-2	Calcium, Total	1500	mg/kg dry wt.	1	50	10		11/17/06 13:08
7440-47-3	Chromium, Total	24	mg/kg dry wt.	1	5.0	0.57		11/17/06 13:08
7440-48-4	Cobalt, Total	10	mg/kg dry wt.	1	2.0	0.35		11/17/06 13:08
7439-95-4	Magnesium, Total	2400	mg/kg dry wt.	1	50	3.4		11/17/06 13:08
7439-96-5	Manganese, Total	1600	mg/kg dry wt.	1	1.0	0.14		11/17/06 13:08
7440-09-7	Potassium, Total	1100	mg/kg dry wt.	1	50	7.5		11/17/06 13:08
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	19	U	11/17/06 13:08
7440-66-6	Zinc, Total	590	mg/kg dry wt.	1	5.0	0.85		11/17/06 13:08

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-26

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/21/06 07:00
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0613731

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-89-6	Iron, Total J,S	39000	mg/kg dry wt.	10	100	4.6		11/22/06 10:05

00393

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-22

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 08:25
Solids: 0.00
Laboratory ID: 0611283-01 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.4999 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	3.4	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:08
7440-50-8	Copper, Total J1S	24	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:08
7439-92-1	Lead, Total	180	mg/kg dry wt.	5	1.0	0.21		11/21/06 14:21
7440-02-0	Nickel, Total J1S	16	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:08
7782-49-2	Selenium, Total	0.38	mg/kg dry wt.	1	0.20	0.063		11/21/06 11:08
7440-22-4	Silver, Total	0.45	mg/kg dry wt.	1	0.10	0.017		11/21/06 11:08
7440-28-0	Thallium, Total	0.44	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:08
7440-62-2	Vanadium, Total J1S	27	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:08

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-22

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 08:25
Solids: 0.00
Laboratory ID: 0611283-01

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	1.9	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:07

00857

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-23

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:05
Solids: 0.00
Laboratory ID: 0611283-02 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.5003 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J,S	2.7	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:12
7440-50-8	Copper, Total J,S	20	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:12
7439-92-1	Lead, Total	200	mg/kg dry wt.	5	1.0	0.21		11/21/06 14:24
7440-02-0	Nickel, Total J,S	17	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:12
7782-49-2	Selenium, Total	0.29	mg/kg dry wt.	1	0.20	0.063		11/21/06 11:12
7440-22-4	Silver, Total	0.20	mg/kg dry wt.	1	0.10	0.017		11/21/06 11:12
7440-28-0	Thallium, Total	0.47	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:12
7440-62-2	Vanadium, Total J,S	26	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:12

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-23

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:05
Solids: 0.00
Laboratory ID: 0611283-02

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.4997 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.26	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:09

00859

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-21

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:25
Solids: 0.00
Laboratory ID: 0611283-03 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J,S	4.4	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:16
7440-50-8	Copper, Total J,S	17	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:16
7439-92-1	Lead, Total	320	mg/kg dry wt.	10	2.0	0.41		11/21/06 14:32
7440-02-0	Nickel, Total J,S	19	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:16
7782-49-2	Selenium, Total	0.33	mg/kg dry wt.	1	0.20	0.063		11/21/06 11:16
7440-22-4	Silver, Total	0.20	mg/kg dry wt.	1	0.10	0.017		11/21/06 11:16
7440-28-0	Thallium, Total	1.9	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:16
7440-62-2	Vanadium, Total J,S	23	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:16

00860

INORGANIC ANALYSIS DATA SHEET

USEPA-6020A

NR-SED-21

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:25
Solids: 0.00
Laboratory ID: 0611283-03

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.26	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:12

00861

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-20

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:50
Solids: 0.00
Laboratory ID: 0611283-04 val flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J15	1.8	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:20
7440-50-8	Copper, Total J15	11	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:20
7439-92-1	Lead, Total	94	mg/kg dry wt.	5	1.0	0.21		11/21/06 14:34
7440-02-0	Nickel, Total J15	9.4	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:20
7782-49-2	Selenium, Total	0.18	mg/kg dry wt.	1	0.20	0.063	J	11/21/06 11:20
7440-22-4	Silver, Total	0.11	mg/kg dry wt.	1	0.10	0.017		11/21/06 11:20
7440-28-0	Thallium, Total	0.25	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:20
7440-62-2	Vanadium, Total J15	18	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:20

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-20

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:50
Solids: 0.00
Laboratory ID: 0611283-04

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.5 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.19	mg/kg dry wt.	1	0.20	0.036	J	11/22/06 11:15

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-19

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:10
Solids: 0.00
Laboratory ID: 0611283-05 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.5001 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	1.7	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:24
7440-50-8	Copper, Total J1S	7.3	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:24
7439-92-1	Lead, Total	96	mg/kg dry wt.	5	1.0	0.21		11/21/06 14:37
7440-02-0	Nickel, Total J1S	6.7	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:24
7782-49-2	Selenium, Total	0.084	mg/kg dry wt.	1	0.20	0.063	J	11/21/06 11:24
7440-22-4	Silver, Total	0.067	mg/kg dry wt.	1	0.10	0.017	J	11/21/06 11:24
7440-28-0	Thallium, Total	0.16	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:24
7440-62-2	Vanadium, Total J1S	14	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:24

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-19

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:10
Solids: 0.00
Laboratory ID: 0611283-05

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.18	mg/kg dry wt.	1	0.20	0.036	J	11/22/06 11:17

00865

INORGANIC ANALYSIS DATA SHEET

USEPA-6020A

NR-SED-18

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:20
Solids: 0.00
Laboratory ID: 0611283-06 Val flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J,S	1.8	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:28
7440-50-8	Copper, Total J,S	13	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:28
7439-92-1	Lead, Total	82	mg/kg dry wt.	2	0.40	0.083		11/21/06 14:39
7440-02-0	Nickel, Total J,S	12	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:28
7782-49-2	Selenium, Total	0.21	mg/kg dry wt.	1	0.20	0.063		11/21/06 11:28
7440-22-4	Silver, Total	0.10	mg/kg dry wt.	1	0.10	0.017		11/21/06 11:28
7440-28-0	Thallium, Total	0.36	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:28
7440-62-2	Vanadium, Total J,S	21	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:28

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-18

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:20
Solids: 0.00
Laboratory ID: 0611283-06

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.4996 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.21	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:20

INORGANIC ANALYSIS DATA SHEET

USEPA-6020A

NR-SED-17

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:35
Solids: 0.00
Laboratory ID: 0611283-07 Val. Flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.4996 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	2.5	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:32
7440-50-8	Copper, Total J1S	19	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:32
7439-92-1	Lead, Total	110	mg/kg dry wt.	5	1.0	0.21		11/21/06 14:41
7440-02-0	Nickel, Total J1S	12	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:32
7782-49-2	Selenium, Total	0.31	mg/kg dry wt.	1	0.20	0.063		11/21/06 11:32
7440-22-4	Silver, Total	0.13	mg/kg dry wt.	1	0.10	0.017		11/21/06 11:32
7440-28-0	Thallium, Total	0.37	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:32
7440-62-2	Vanadium, Total J1S	20	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:32

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-17

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:35
Solids: 0.00
Laboratory ID: 0611283-07

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.5004 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.47	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:22

00869

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-16

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:50
Solids: 0.00
Laboratory ID: 0611283-08 Val. Flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.5001 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	4.3	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:36
7440-50-8	Copper, Total J1S	20	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:36
7439-92-1	Lead, Total	500	mg/kg dry wt.	20	4.0	0.83		11/21/06 14:43
7440-02-0	Nickel, Total J1S	17	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:36
7782-49-2	Selenium, Total	0.45	mg/kg dry wt.	1	0.20	0.063		11/21/06 11:36
7440-22-4	Silver, Total	0.22	mg/kg dry wt.	1	0.10	0.017		11/21/06 11:36
7440-28-0	Thallium, Total	2.3	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:36
7440-62-2	Vanadium, Total J1S	24	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:36

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-16

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:50
Solids: 0.00
Laboratory ID: 0611283-08

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.5 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.32	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:25

00871

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-15

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:00
Solids: 0.00
Laboratory ID: 0611283-09 Val. Flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	2.3	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:48
7440-50-8	Copper, Total J1S	13	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:48
7439-92-1	Lead, Total	190	mg/kg dry wt.	5	1.0	0.21		11/21/06 14:45
7440-02-0	Nickel, Total J1S	12	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:48
7782-49-2	Selenium, Total	0.20	mg/kg dry wt.	1	0.20	0.063	J	11/21/06 11:48
7440-22-4	Silver, Total	0.14	mg/kg dry wt.	1	0.10	0.017		11/21/06 11:48
7440-28-0	Thallium, Total	0.94	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:48
7440-62-2	Vanadium, Total J1S	21	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:48

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-15

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:00
Solids: 0.00
Laboratory ID: 0611283-09

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.20	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:33

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-10 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.4997 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	2.3	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:52
7440-50-8	Copper, Total J1S	17	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:52
7439-92-1	Lead, Total	110	mg/kg dry wt.	5	1.0	0.21		11/21/06 14:48
7440-02-0	Nickel, Total J1S	11	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:52
7782-49-2	Selenium, Total	0.18	mg/kg dry wt.	1	0.20	0.063	J	11/21/06 11:52
7440-22-4	Silver, Total	0.12	mg/kg dry wt.	1	0.10	0.017		11/21/06 11:52
7440-28-0	Thallium, Total	0.35	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:52
7440-62-2	Vanadium, Total J1S	20	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:52

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-10

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.4996 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.45	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:35

00875

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:25
Solids: 0.00
Laboratory ID: 0611283-11 Val. Flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.5 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total L1m	1.6	mg/kg dry wt.	1	0.10	0.023		11/21/06 11:55
7440-50-8	Copper, Total J1S	8.6	mg/kg dry wt.	1	0.10	0.022		11/21/06 11:55
7439-92-1	Lead, Total L1m	86	mg/kg dry wt.	5	1.0	0.21		11/21/06 14:50
7440-02-0	Nickel, Total J1S	7.9	mg/kg dry wt.	1	0.10	0.027		11/21/06 11:55
7782-49-2	Selenium, Total L1m	0.16	mg/kg dry wt.	1	0.20	0.063	J	11/21/06 11:55
7440-22-4	Silver, Total	0.081	mg/kg dry wt.	1	0.10	0.017	J	11/21/06 11:55
7440-28-0	Thallium, Total	0.27	mg/kg dry wt.	1	0.10	0.0085		11/21/06 11:55
7440-62-2	Vanadium, Total J1S	15	mg/kg dry wt.	1	0.10	0.024		11/21/06 11:55

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:25
Solids: 0.00
Laboratory ID: 0611283-11

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.11	mg/kg dry wt.	1	0.20	0.036	J	11/22/06 11:38

00877

INORGANIC ANALYSIS DATA SHEET

USEPA-6020A

NR-SED-13

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Matrix: Sediment
Preparation: 3050B Digestion
Sampled: 11/08/06 11:50
Prepared: 11/16/06 07:05
Solids: 0.00
Initial/Final: 0.5002 g / 250 mL
Laboratory ID: 0611283-12 Val. Flag
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	2.0	mg/kg dry wt.	1	0.10	0.023		11/21/06 16:44
7440-50-8	Copper, Total J1S	17	mg/kg dry wt.	1	0.10	0.022		11/21/06 14:00
7439-92-1	Lead, Total	130	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:47
7440-02-0	Nickel, Total J1S	11	mg/kg dry wt.	1	0.10	0.027		11/21/06 14:00
7782-49-2	Selenium, Total	0.41	mg/kg dry wt.	1	0.20	0.063		11/21/06 16:44
7440-22-4	Silver, Total	0.15	mg/kg dry wt.	1	0.10	0.017		11/21/06 14:00
7440-28-0	Thallium, Total	0.31	mg/kg dry wt.	1	0.10	0.0085		11/21/06 14:00
7440-62-2	Vanadium, Total J1S	20	mg/kg dry wt.	1	0.10	0.024		11/21/06 14:00

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:50
Solids: 0.00
Laboratory ID: 0611283-12

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.4997 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.60	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:51

00879

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-12

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:00
Solids: 0.00
Laboratory ID: 0611283-13 Val flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	1.6	mg/kg dry wt.	1	0.10	0.023		11/21/06 16:47
7440-50-8	Copper, Total J1S	12	mg/kg dry wt.	1	0.10	0.022		11/21/06 14:04
7439-92-1	Lead, Total	100	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:49
7440-02-0	Nickel, Total J1S	8.2	mg/kg dry wt.	1	0.10	0.027		11/21/06 14:04
7782-49-2	Selenium, Total	0.18	mg/kg dry wt.	1	0.20	0.063	J	11/21/06 16:47
7440-22-4	Silver, Total	0.088	mg/kg dry wt.	1	0.10	0.017	J	11/21/06 14:04
7440-28-0	Thallium, Total	0.23	mg/kg dry wt.	1	0.10	0.0085		11/21/06 14:04
7440-62-2	Vanadium, Total J1S	17	mg/kg dry wt.	1	0.10	0.024		11/21/06 14:04

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-12

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:00
Solids: 0.00
Laboratory ID: 0611283-13

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.4999 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.40	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:53

INORGANIC ANALYSIS DATA SHEET

USEPA-6020A

NR-SED-11

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:35
Solids: 0.00
Laboratory ID: 0611283-14 val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	1.7	mg/kg dry wt.	1	0.10	0.023		11/21/06 12:25
7440-50-8	Copper, Total J1S	19	mg/kg dry wt.	1	0.10	0.022		11/21/06 12:25
7439-92-1	Lead, Total	120	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:07
7440-02-0	Nickel, Total J1S	12	mg/kg dry wt.	1	0.10	0.027		11/21/06 12:25
7782-49-2	Selenium, Total	0.25	mg/kg dry wt.	1	0.20	0.063		11/21/06 12:25
7440-22-4	Silver, Total	0.13	mg/kg dry wt.	1	0.10	0.017		11/21/06 12:25
7440-28-0	Thallium, Total	0.38	mg/kg dry wt.	1	0.10	0.0085		11/21/06 12:25
7440-62-2	Vanadium, Total J1S	21	mg/kg dry wt.	1	0.10	0.024		11/21/06 12:25

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-11

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:35
Solids: 0.00
Laboratory ID: 0611283-14

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.55	mg/kg dry wt.	1	0.20	0.036		11/22/06 11:56

00883

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-10

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:50
Solids: 0.00
Laboratory ID: 0611283-15 Val Flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	2.5	mg/kg dry wt.	1	0.10	0.023		11/21/06 16:50
7440-50-8	Copper, Total J1S	24	mg/kg dry wt.	1	0.10	0.022		11/21/06 12:37
7439-92-1	Lead, Total	280	mg/kg dry wt.	10	2.0	0.41		11/21/06 15:09
7440-02-0	Nickel, Total J1S	17	mg/kg dry wt.	1	0.10	0.027		11/21/06 12:37
7782-49-2	Selenium, Total	0.24	mg/kg dry wt.	1	0.20	0.063		11/21/06 12:37
7440-22-4	Silver, Total	0.16	mg/kg dry wt.	1	0.10	0.017		11/21/06 12:37
7440-28-0	Thallium, Total	0.60	mg/kg dry wt.	1	0.10	0.0085		11/21/06 12:37
7440-62-2	Vanadium, Total J1S	40	mg/kg dry wt.	1	0.10	0.024		11/21/06 12:37

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-10

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:50
Solids: 0.00
Laboratory ID: 0611283-15

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.4997 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.66	mg/kg dry wt.	1	0.20	0.036		11/22/06 12:04

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-9

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:05
Solids: 0.00
Laboratory ID: 0611283-16 val flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.4996 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	1.9	mg/kg dry wt.	1	0.10	0.023		11/21/06 16:52
7440-50-8	Copper, Total J1S	16	mg/kg dry wt.	1	0.10	0.022		11/21/06 12:41
7439-92-1	Lead, Total	170	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:12
7440-02-0	Nickel, Total J1S	10	mg/kg dry wt.	1	0.10	0.027		11/21/06 12:41
7782-49-2	Selenium, Total	0.15	mg/kg dry wt.	1	0.20	0.063	J	11/21/06 12:41
7440-22-4	Silver, Total	0.11	mg/kg dry wt.	1	0.10	0.017		11/21/06 12:41
7440-28-0	Thallium, Total	0.46	mg/kg dry wt.	1	0.10	0.0085		11/21/06 12:41
7440-62-2	Vanadium, Total J1S	17	mg/kg dry wt.	1	0.10	0.024		11/21/06 12:41

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-9

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:05
Solids: 0.00
Laboratory ID: 0611283-16

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.5001 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	1.1	mg/kg dry wt.	1	0.20	0.036		11/22/06 12:06

00887

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-8

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:25
Solids: 0.00
Laboratory ID: 0611283-17 Val-1 19g

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J,S	2.0	mg/kg dry wt.	1	0.10	0.023		11/21/06 16:55
7440-50-8	Copper, Total J,S	13	mg/kg dry wt.	1	0.10	0.022		11/21/06 12:45
7439-92-1	Lead, Total	47	mg/kg dry wt.	1	0.20	0.041		11/21/06 12:45
7440-02-0	Nickel, Total J,S	10	mg/kg dry wt.	1	0.10	0.027		11/21/06 12:45
7782-49-2	Selenium, Total	0.10	mg/kg dry wt.	1	0.20	0.063	J	11/21/06 12:45
7440-22-4	Silver, Total	0.098	mg/kg dry wt.	1	0.10	0.017	J	11/21/06 12:45
7440-28-0	Thallium, Total	0.19	mg/kg dry wt.	1	0.10	0.0085		11/21/06 12:45
7440-62-2	Vanadium, Total J,S	15	mg/kg dry wt.	1	0.10	0.024		11/21/06 12:45

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-8

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:25
Solids: 0.00
Laboratory ID: 0611283-17

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.16	mg/kg dry wt.	1	0.20	0.036	J	11/22/06 12:09

00889

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP-2

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Matrix: Sediment
Preparation: 3050B Digestion
Sampled: 11/08/06 00:00
Prepared: 11/16/06 07:05
Solids: 0.00
Initial/Final: 0.4995 g / 250 mL
Laboratory ID: 0611283-18 Vol. Slag
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J15	2.1	mg/kg dry wt.	1	0.10	0.023		11/21/06 16:58
7440-50-8	Copper, Total J15	21	mg/kg dry wt.	1	0.10	0.022		11/21/06 12:49
7439-92-1	Lead, Total	210	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:14
7440-02-0	Nickel, Total J15	8.5	mg/kg dry wt.	1	0.10	0.027		11/21/06 12:49
7782-49-2	Selenium, Total	0.18	mg/kg dry wt.	1	0.20	0.063	J	11/21/06 12:49
7440-22-4	Silver, Total	0.10	mg/kg dry wt.	1	0.10	0.017		11/21/06 12:49
7440-28-0	Thallium, Total	0.41	mg/kg dry wt.	1	0.10	0.0085		11/21/06 12:49
7440-62-2	Vanadium, Total J15	17	mg/kg dry wt.	1	0.10	0.024		11/21/06 12:49

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-18

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.4996 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	1.7	mg/kg dry wt.	1	0.20	0.036		11/22/06 12:11

00891

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:40
Solids: 0.00
Laboratory ID: 0611283-19 val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 07:05
Initial/Final: 0.5004 g / 250 mL
QC Batch: 0613493

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J15	2.3	mg/kg dry wt.	1	0.10	0.023		11/21/06 17:00
7440-50-8	Copper, Total J15	20	mg/kg dry wt.	1	0.10	0.022		11/21/06 12:53
7439-92-1	Lead, Total	90	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:16
7440-02-0	Nickel, Total J15	13	mg/kg dry wt.	1	0.10	0.027		11/21/06 12:53
7782-49-2	Selenium, Total	0.22	mg/kg dry wt.	1	0.20	0.063		11/21/06 12:53
7440-22-4	Silver, Total	0.16	mg/kg dry wt.	1	0.10	0.017		11/21/06 12:53
7440-28-0	Thallium, Total	0.40	mg/kg dry wt.	1	0.10	0.0085		11/21/06 12:53
7440-62-2	Vanadium, Total J15	23	mg/kg dry wt.	1	0.10	0.024		11/21/06 12:53

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:40
Solids: 0.00
Laboratory ID: 0611283-19

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/17/06 12:00
Initial/Final: 0.4997 g / 250 mL
QC Batch: 0613626

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.19	mg/kg dry wt.	1	0.20	0.036	J	11/22/06 12:13

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:50
Solids: 0.00
Laboratory ID: 0611283-20 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.5 g / 250 mL
QC Batch: 0613466

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J,S	6.1	mg/kg dry wt.	1	0.10	0.023		11/22/06 08:20
7440-50-8	Copper, Total J,S	47	mg/kg dry wt.	5	0.50	0.11		11/21/06 15:18
7439-92-1	Lead, Total	88	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:18
7440-02-0	Nickel, Total J,S	13	mg/kg dry wt.	1	0.10	0.027		11/21/06 13:04
7782-49-2	Selenium, Total L1M	0.63	mg/kg dry wt.	1	0.20	0.063		11/22/06 08:20
7440-22-4	Silver, Total	0.18	mg/kg dry wt.	1	0.10	0.017		11/21/06 13:04
7440-28-0	Thallium, Total	0.55	mg/kg dry wt.	1	0.10	0.0085		11/21/06 13:04
7440-62-2	Vanadium, Total J,S	23	mg/kg dry wt.	1	0.10	0.024		11/21/06 13:04

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:50
Solids: 0.00
Laboratory ID: 0611283-20 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 14:00
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613548

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total B, P	0.48	mg/kg dry wt.	1	0.20	0.036		11/22/06 12:19

00895

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:05
Solids: 0.00
Laboratory ID: 0611283-21 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.5004 g / 250 mL
QC Batch: 0613466

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J,S	2.5	mg/kg dry wt.	1	0.10	0.023		11/22/06 08:34
7440-50-8	Copper, Total J,S	23	mg/kg dry wt.	1	0.10	0.022		11/21/06 13:37
7439-92-1	Lead, Total	160	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:36
7440-02-0	Nickel, Total J,S	13	mg/kg dry wt.	1	0.10	0.027		11/21/06 13:37
7782-49-2	Selenium, Total	0.14	mg/kg dry wt.	1	0.20	0.063	J	11/22/06 08:34
7440-22-4	Silver, Total	0.20	mg/kg dry wt.	1	0.10	0.017		11/21/06 13:37
7440-28-0	Thallium, Total	0.58	mg/kg dry wt.	1	0.10	0.0085		11/21/06 13:37
7440-62-2	Vanadium, Total J,S	22	mg/kg dry wt.	1	0.10	0.024		11/21/06 13:37

INORGANIC ANALYSIS DATA SHEET

USEPA-6020A

NR-SED-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:05
Solids: 0.00
Laboratory ID: 0611283-21 Val flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 14:00
Initial/Final: 0.5 g / 250 mL
QC Batch: 0613548

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total B IP	0.37	mg/kg dry wt.	1	0.20	0.036		11/22/06 12:34

00897

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:25
Solids: 0.00
Laboratory ID: 0611283-22 val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.4997 g / 250 mL
QC Batch: 0613466

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	1.6	mg/kg dry wt.	1	0.10	0.023		11/22/06 08:36
7440-50-8	Copper, Total J1S	8.7	mg/kg dry wt.	1	0.10	0.022		11/21/06 13:41
7439-92-1	Lead, Total	77	mg/kg dry wt.	2	0.40	0.083		11/21/06 15:38
7440-02-0	Nickel, Total J1S	7.9	mg/kg dry wt.	1	0.10	0.027		11/21/06 13:41
7782-49-2	Selenium, Total	0.12	mg/kg dry wt.	1	0.20	0.063	J	11/22/06 08:36
7440-22-4	Silver, Total	0.097	mg/kg dry wt.	1	0.10	0.017	J	11/21/06 13:41
7440-28-0	Thallium, Total	0.22	mg/kg dry wt.	1	0.10	0.0085		11/21/06 13:41
7440-62-2	Vanadium, Total J1S	16	mg/kg dry wt.	1	0.10	0.024		11/21/06 13:41

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:25
Solids: 0.00
Laboratory ID: 0611283-22 Val flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 14:00
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0613548

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total B1P	0.20	mg/kg dry wt.	1	0.20	0.036	J	11/22/06 12:36

00899

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:35
Solids: 0.00
Laboratory ID: 0611283-23 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.4999 g / 250 mL
QC Batch: 0613466

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J1S	2.2	mg/kg dry wt.	1	0.10	0.023		11/22/06 08:39
7440-50-8	Copper, Total J1S	15	mg/kg dry wt.	1	0.10	0.022		11/21/06 13:44
7439-92-1	Lead, Total	91	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:40
7440-02-0	Nickel, Total J1S	11	mg/kg dry wt.	1	0.10	0.027		11/21/06 13:44
7782-49-2	Selenium, Total	0.13	mg/kg dry wt.	1	0.20	0.063	J	11/22/06 08:39
7440-22-4	Silver, Total	0.12	mg/kg dry wt.	1	0.10	0.017		11/21/06 13:44
7440-28-0	Thallium, Total	0.28	mg/kg dry wt.	1	0.10	0.0085		11/21/06 13:44
7440-62-2	Vanadium, Total J1S	22	mg/kg dry wt.	1	0.10	0.024		11/21/06 13:44

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:35
Solids: 0.00
Laboratory ID: 0611283-23 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 14:00
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0613548

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total B IP	0.26	mg/kg dry wt.	1	0.20	0.036		11/22/06 12:38

00901

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-4

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:50
Solids: 0.00
Laboratory ID: 0611283-24 val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613466

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J/S	2.2	mg/kg dry wt.	1	0.10	0.023		11/22/06 08:47
7440-50-8	Copper, Total J/S	25	mg/kg dry wt.	1	0.10	0.022		11/21/06 13:48
7439-92-1	Lead, Total	43	mg/kg dry wt.	1	0.20	0.041		11/21/06 13:48
7440-02-0	Nickel, Total J/S	22	mg/kg dry wt.	1	0.10	0.027		11/21/06 13:48
7782-49-2	Selenium, Total	0.084	mg/kg dry wt.	1	0.20	0.063	J	11/22/06 08:47
7440-22-4	Silver, Total	0.16	mg/kg dry wt.	1	0.10	0.017		11/21/06 13:48
7440-28-0	Thallium, Total	0.56	mg/kg dry wt.	1	0.10	0.0085		11/21/06 13:48
7440-62-2	Vanadium, Total J/S	45	mg/kg dry wt.	1	0.10	0.024		11/21/06 13:48

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-4

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:50
Solids: 0.00
Laboratory ID: 0611283-24 val flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 14:00
Initial/Final: 0.5 g / 250 mL
QC Batch: 0613548

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total B IP	0.13	mg/kg dry wt.	1	0.20	0.036	J	11/22/06 12:40

00903

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-7

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 15:00
Solids: 0.00
Laboratory ID: 0611283-25 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613466

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J/S	2.1	mg/kg dry wt.	1	0.10	0.023		11/22/06 08:49
7440-50-8	Copper, Total J/S	12	mg/kg dry wt.	1	0.10	0.022		11/21/06 13:52
7439-92-1	Lead, Total	100	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:42
7440-02-0	Nickel, Total J/S	12	mg/kg dry wt.	1	0.10	0.027		11/21/06 13:52
7782-49-2	Selenium, Total	0.23	mg/kg dry wt.	1	0.20	0.063		11/22/06 08:49
7440-22-4	Silver, Total	0.13	mg/kg dry wt.	1	0.10	0.017		11/21/06 13:52
7440-28-0	Thallium, Total	0.44	mg/kg dry wt.	1	0.10	0.0085		11/21/06 13:52
7440-62-2	Vanadium, Total J/S	21	mg/kg dry wt.	1	0.10	0.024		11/21/06 13:52

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

NR-SED-7

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 15:00
Solids: 0.00
Laboratory ID: 0611283-25 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 14:00
Initial/Final: 0.4998 g / 250 mL
QC Batch: 0613548

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total B 18	0.13	mg/kg dry wt.	1	0.20	0.036	J	11/22/06 12:42

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-26 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/15/06 07:15
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0613466

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total J,S	2.6	mg/kg dry wt.	1	0.10	0.023		11/22/06 08:52
7440-50-8	Copper, Total J,S	29	mg/kg dry wt.	1	0.10	0.022		11/21/06 13:56
7439-92-1	Lead, Total	160	mg/kg dry wt.	5	1.0	0.21		11/21/06 15:44
7440-02-0	Nickel, Total J,S	13	mg/kg dry wt.	1	0.10	0.027		11/21/06 13:56
7782-49-2	Selenium, Total	0.12	mg/kg dry wt.	1	0.20	0.063	J	11/22/06 08:52
7440-22-4	Silver, Total	0.22	mg/kg dry wt.	1	0.10	0.017		11/21/06 13:56
7440-28-0	Thallium, Total	0.68	mg/kg dry wt.	1	0.10	0.0085		11/21/06 13:56
7440-62-2	Vanadium, Total J,S	23	mg/kg dry wt.	1	0.10	0.024		11/21/06 13:56

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-26 Val. flag

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 11/16/06 14:00
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0613548

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total B IP	0.33	mg/kg dry wt.	1	0.20	0.036		11/22/06 12:45

00907

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-22

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 08:25
Solids: 0.00
Laboratory ID: 0611283-01

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 11/16/06 14:00
Initial/Final: 0.2998 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.16	mg/kg dry wt.	1	0.050	0.0077		11/17/06 08:40

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-23

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:05
Solids: 0.00
Laboratory ID: 0611283-02

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2998 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.090	mg/kg dry wt.	1	0.050	0.0077		11/17/06 08:45

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-21

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:25
Solids: 0.00
Laboratory ID: 0611283-03

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.3 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.079	mg/kg dry wt.	1	0.050	0.0077		11/17/06 08:49

01317

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-20

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 09:50
Solids: 0.00
Laboratory ID: 0611283-04

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.3001 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.036	mg/kg dry wt.	1	0.050	0.0077	J	11/17/06 08:55

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-19

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:10
Solids: 0.00
Laboratory ID: 0611283-05

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2998 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.024	mg/kg dry wt.	1	0.050	0.0077	J	11/17/06 09:00

01319

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-18

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:20
Solids: 0.00
Laboratory ID: 0611283-06

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2996 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.044	mg/kg dry wt.	1	0.050	0.0077	J	11/17/06 09:05

01320

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-17

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:35
Solids: 0.00
Laboratory ID: 0611283-07

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2995 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.078	mg/kg dry wt.	1	0.050	0.0077		11/17/06 09:10

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-16

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 10:50
Solids: 0.00
Laboratory ID: 0611283-08

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 11/16/06 14:00
Initial/Final: 0.2999 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.11	mg/kg dry wt.	1	0.050	0.0077		11/17/06 09:30

01322

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-15

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:00
Solids: 0.00
Laboratory ID: 0611283-09

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2995 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.048	mg/kg dry wt.	1	0.050	0.0077	J	11/17/06 09:44

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-10

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2995 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.063	mg/kg dry wt.	1	0.050	0.0077		11/17/06 09:49

01324

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:25
Solids: 0.00
Laboratory ID: 0611283-11

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2998 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.033	mg/kg dry wt.	1	0.050	0.0077	J	11/17/06 09:53

01325

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 11:50
Solids: 0.00
Laboratory ID: 0611283-12

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2997 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.056	mg/kg dry wt.	1	0.050	0.0077		11/17/06 10:11

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-12

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:00
Solids: 0.00
Laboratory ID: 0611283-13

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2998 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.042	mg/kg dry wt.	1	0.050	0.0077	J	11/17/06 10:16

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-11

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:35
Solids: 0.00
Laboratory ID: 0611283-14

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.065	mg/kg dry wt.	1	0.050	0.0077		11/17/06 10:20

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-10

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 12:50
Solids: 0.00
Laboratory ID: 0611283-15

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.11	mg/kg dry wt.	1	0.050	0.0077		11/17/06 10:25

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-9

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:05
Solids: 0.00
Laboratory ID: 0611283-16

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2995 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.041	mg/kg dry wt.	1	0.050	0.0077	J	11/17/06 10:30

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-8

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:25
Solids: 0.00
Laboratory ID: 0611283-17

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2995 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.26	mg/kg dry wt.	1	0.050	0.0077		11/17/06 10:45

01331

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

DUP-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-18

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.3 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.058	mg/kg dry wt.	1	0.050	0.0077		11/17/06 10:49

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:40
Solids: 0.00
Laboratory ID: 0611283-19

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 11/16/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0613549

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.44	mg/kg dry wt.	1	0.050	0.0077		11/17/06 10:54

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 13:50
Solids: 0.00
Laboratory ID: 0611283-20

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.3 g / 50 mL
QC Batch: 0613550

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.43	mg/kg dry wt.	1	0.050	0.0077		11/17/06 11:08

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:05
Solids: 0.00
Laboratory ID: 0611283-21

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 11/16/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0613550

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.084	mg/kg dry wt.	1	0.050	0.0077		11/17/06 11:53

01335

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:25
Solids: 0.00
Laboratory ID: 0611283-22

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2998 g / 50 mL
QC Batch: 0613550

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.025	mg/kg dry wt.	1	0.050	0.0077	J	11/17/06 11:58

01336

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:35
Solids: 0.00
Laboratory ID: 0611283-23

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0613550

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.041	mg/kg dry wt.	1	0.050	0.0077	J	11/17/06 12:12

01337

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-4

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 14:50
Solids: 0.00
Laboratory ID: 0611283-24

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0613550

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.068	mg/kg dry wt.	1	0.050	0.0077		11/17/06 12:17

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

NR-SED-7

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 15:00
Solids: 0.00
Laboratory ID: 0611283-25

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestio
Prepared: 11/16/06 14:00
Initial/Final: 0.2999 g / 50 mL
QC Batch: 0613550

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.061	mg/kg dry wt.	1	0.050	0.0077		11/17/06 12:21

01339

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

DUP-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Sediment
Sampled: 11/08/06 00:00
Solids: 0.00
Laboratory ID: 0611283-26

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 7471A Mercury Digestic
Prepared: 11/16/06 14:00
Initial/Final: 0.2999 g / 50 mL
QC Batch: 0613550

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.13	mg/kg dry wt.	1	0.050	0.0077		11/17/06 12:26

01348

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 110107
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
_X__ SW-846
_X__ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 11656351.30007
Laboratory: TriMatrix
SDG No.: 30440-29
Test Name: Explosives
Method No.: 8330

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 ^{O}C, then flag L(+)/UL(-).			
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			✓

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve? If no, flag "R".	✓		
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".	✓		
4.3	Were continuing calibration standards analyzed every 12 hours or twenty samples? If no, flag "R".	✓		
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±15%) or %D(≤15%) within			
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>15%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 15%, J(+), only. Negative Bias - %D>-15% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes:

5.0 Laboratory Control Sample (LCS)		Yes	No	NA
5.1	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.2	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
5.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.			✓

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.2	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			✓
6.3	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓
	<10% low high			
	Positives L L K			
	Non-detects R UL No action			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional judgement.			

Notes: MSD for NR-SED-5 <75% at 73% for 2-Amino-4,6-dinitrotoluene
Parent ND → UJ/M

MS/MSD for NR-SED-14 / 125% for 2-Amino-4,6-dinitrotoluene at 182% / 185%.) Parent ND, No action

8.0 Field Duplicate		Yes	No	NA
8.1	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: NR-SED-17 and DUP-1 Both NDs ✓ NR-SED-9 and DUP-2 Both NDs ✓ NR-SED-3 and DUP-3 Both NDs ✓

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	✓		
10.1.1	Number of samples:			
10.1.2	Number of target compounds in each analysis: 14			
10.1.3	Number of results rejected or not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL

Laboratory ID: 0613520-MS1
QC Batch: 0613520

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.00	ND	1.75	88	75 - 100	mg/kg dry wt.
1,3-Dinitrobenzene	2.00	ND	1.89	94	80 - 125	mg/kg dry wt.
2,4,6-Trinitrotoluene	2.00	ND	1.78	89	70 - 111	mg/kg dry wt.
2,4-Dinitrotoluene	2.00	ND	1.78	89	80 - 112	mg/kg dry wt.
2,6-Dinitrotoluene	2.00	ND	1.80	90	80 - 120	mg/kg dry wt.
2-Amino-4,6-dinitrotoluene	2.00	ND	3.64	182 *	75 - 125	mg/kg dry wt.
2-Nitrotoluene	2.00	ND	1.78	89	80 - 125	mg/kg dry wt.
3-Nitrotoluene	2.00	ND	1.90	95	75 - 120	mg/kg dry wt.
4-Amino-2,6-dinitrotoluene	2.00	ND	1.91	96	75 - 125	mg/kg dry wt.
4-Nitrotoluene	2.00	ND	1.96	98	75 - 125	mg/kg dry wt.
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.00	ND	1.92	96	70 - 105	mg/kg dry wt.
Methyl-2,4,6-trinitrophenylnitram	2.00	ND	1.27	64	28 - 123	mg/kg dry wt.
Nitrobenzene	2.00	ND	1.86	93	76 - 118	mg/kg dry wt.
Octahydro-1,3,5,7-tetranitro-1,3,5	2.00	ND	2.01	101	75 - 105	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00091

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL

Laboratory ID: 0613520-MSD1
QC Batch: 0613520

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.00	1.86	93	6	20	75 - 100	mg/kg dry wt.
1,3-Dinitrobenzene	2.00	1.87	94	0.9	20	80 - 125	mg/kg dry wt.
2,4,6-Trinitrotoluene	2.00	1.81	91	2	20	70 - 111	mg/kg dry wt.
2,4-Dinitrotoluene	2.00	1.89	95	6	20	80 - 112	mg/kg dry wt.
2,6-Dinitrotoluene	2.00	1.86	93	3	20	80 - 120	mg/kg dry wt.
2-Amino-4,6-dinitrotoluene	2.00	3.71	185 *	2	20	75 - 125	mg/kg dry wt.
2-Nitrotoluene	2.00	1.83	92	3	20	80 - 125	mg/kg dry wt.
3-Nitrotoluene	2.00	1.80	90	5	20	75 - 120	mg/kg dry wt.
4-Amino-2,6-dinitrotoluene	2.00	1.91	96	0.09	20	75 - 125	mg/kg dry wt.
4-Nitrotoluene	2.00	1.99	100	2	20	75 - 125	mg/kg dry wt.
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.00	1.92	96	0.5	20	70 - 105	mg/kg dry wt.
Methyl-2,4,6-trinitrophenylnitram	2.00	1.31	66	3	20	28 - 123	mg/kg dry wt.
Nitrobenzene	2.00	1.85	93	0.1	20	76 - 118	mg/kg dry wt.
Octahydro-1,3,5,7-tetranitro-1,3,5	2.00	2.00	100	0.5	20	75 - 105	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00092

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

NR-SED-5

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Matrix: Soil
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL
Laboratory ID: 0613521-MSD1
QC Batch: 0613521

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.00	1.69	85	3	20	75 - 100	mg/kg dry wt.
1,3-Dinitrobenzene	2.00	1.67	84	1	20	80 - 125	mg/kg dry wt.
2,4,6-Trinitrotoluene	2.00	1.67	83	3	20	70 - 111	mg/kg dry wt.
2,4-Dinitrotoluene	2.00	1.69	84	0.6	20	80 - 112	mg/kg dry wt.
2,6-Dinitrotoluene	2.00	1.79	90	2	20	80 - 120	mg/kg dry wt.
2-Amino-4,6-dinitrotoluene	4.00	2.90	73 *	3	20	75 - 125	mg/kg dry wt.
2-Nitrotoluene	2.00	1.74	87	2	20	80 - 125	mg/kg dry wt.
3-Nitrotoluene	2.00	1.76	88	8	20	75 - 120	mg/kg dry wt.
4-Amino-2,6-dinitrotoluene	2.00	1.59	80	2	20	75 - 125	mg/kg dry wt.
4-Nitrotoluene	2.00	1.71	85	1	20	75 - 125	mg/kg dry wt.
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.00	1.84	92	3	20	70 - 105	mg/kg dry wt.
Methyl-2,4,6-trinitrophenylnitram	2.00	1.41	71	2	20	28 - 123	mg/kg dry wt.
Nitrobenzene	2.00	1.79	89	2	20	76 - 118	mg/kg dry wt.
Octahydro-1,3,5,7-tetranitro-1,3,5	2.00	1.90	95	2	20	75 - 105	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

STATEMENT OF DATA QUALIFICATIONS

Nitroaromatics & Nitramines by EPA Method 8330

Qualification: The MS or MSD recovery, but not both, was outside the control limit. The RPD is within the control limit. The unspiked sample result is not qualified.

Analysis: USEPA-8330

Sample/Analyte: 0611283-20 NR-SED-5 2-Amino-4,6-dinitrotoluene

Quality Control Results – Nitroaromatic Explosives

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications for both the primary and confirmation columns were method-compliant.

Method Blanks

No target analytes were detected above one-half the RL. In addition, there were no J-flagged detections.

Surrogates

All surrogate recoveries were in control for both the primary column and confirmation column runs.

Laboratory Control Samples

Each Laboratory Control Sample (LCS) was fortified with all target analytes. All recoveries were in control for both the primary column and confirmation column runs.

Matrix Spikes

Samples 'NR-SED-14' and 'NR-SED-5' were fortified with all target analytes. All recoveries and RPDs were in control with the exception of one recovery (73%) for 2-Amino-4,6-DNT in'NR-SED-5'.

Sample Results

See Section B. Second-column analysis was needed for six samples due to tentative detections of one or more target analytes on the primary column. Those confirmation analyses are identified by the laboratory sample ID plus an 'RE1' suffix. The confirmation analyses were performed at a different date and time and, for the two samples for which a tentative detection was confirmed, summary forms and raw data have been included following that for the primary column. Where an analyte was confirmed, the primary column result has been reported (both RPDs were less than 40%). For the remaining four samples that did not confirm, raw data (only) has been included at the end of the 'Preparation Logs/Miscellaneous Confirmation Column' subsection.

Note: for all soil samples for explosives analysis, a representative subsample is air-dried and a smaller measured amount of that dried subsample is then extracted. Unlike most other parameters for a soil sample that are processed on a wet-weight basis, a Percent Solids value (if determined) for the sample is not applied to the MDL, RL, or to the result.

Statements of Data Qualification

See Narrative Attachment 2.

This report shall not be reproduced except in full, without written authorization of TriMatrix Laboratories, Inc.
Individual sample results relate only to the sample tested.

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-29
Project No.: 11605635 1.30007

Project Name: Radford SWMU 54
Reviewer: RA
Date: 1/11/07

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓			✓			✓					
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓			✓			✓					
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓			✓			✓				
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{O}C \pm 2\ ^{O}C$)	✓			✓			✓					
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓			✓			✓					

Note: _____

2.0 Holding Time		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓			✓			✓				

Note: _____

3.0 Instrument Calibration		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".	✓			✓			✓					
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).	✓			✓			✓					
3.3	Once per calibration, did a high and low distilled standard recovery within 85-115%? If no, follow 3.6.												
3.4	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	✓			✓			✓					
3.5	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	✓			✓			✓					
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP 90%-110%, FOR Hg 80-120%, FOR CN 85-115%.	✓			✓			✓					
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%												
3.7	For ICP & ICPMS, did the CRDL standard recover between 80-120%?	✓			✓								
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K												

Note: [redacted]

4.0 Blanks

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓			✓			✓					
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓			✓			✓					
4.3	Are there reported MB or ICB/CCBs values > MDL?	✓			✓			✓					
	Sample Results > MDL												
	< 5X Blank Contamination B												
4.4	Are there negative blank results with the absolute value > MDL?	✓			✓				✓				
	Sample Results Non-detects > MDL												
	< 5X absolute Blank Contamination UL L												
4.5	Are there reported field blank > ± MDL?			✓			✓		✓				
	Sample Results > MDL												
	< 5X Blank Contamination B												

Note: 6010 → MB several pos, <5 x B, P, CCBs several pos and neg. all 75x, No action. See above
6020 → MB → pos, V, lead all >5x, No action, ✓ MB → antimony <5x → B, P
6020 → CCB → V, lead, (Se neg.) As, (neg Sb) pos, antimony
ICB, antimony
Hg → ICB at 0.0465 ug/L
all 75x, No action

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	✓			✓								
5.2	Are the ICS AB recoveries within 80% - 120%?	✓			✓								
5.3	Are the results for unspiked analytes (in ICS A) < ± RL?	✓			✓								
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓			✓						
	If not...												
	Action: Not Spiked Analytes: < -MDL L(+)/UL(-); > MDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)												

Note: NA Level IV

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	✓			✓			✓					
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		✓			✓			✓				

Action:	Solid		Aqueous		
	< LCL	> UCL	< 50%	50% - 79%	> 120%
	L(+)/UL(-)	K(+)	L(+)/R(-)	L(+)/UL(-)	K(+)

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	✓			✓			✓					
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.												
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	✓			✓			✓					

Note:

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓			✓			✓					
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125% for aqueous matrices or lab limits for soil matrices?		✓			✓		✓					
	%R > 125% 30%< %R < 74% < 30%												
	Positive K L L												
	Non-detect None UL R												
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.		✓			✓				✓			

Note: 6010 → MS for NR-SED-14 196% for Mg, RPD 27%. 720% → Lim Parent
6010 → MS fo " " 251%. for Ca, RPD. 48%. 720%. → Lim Parent
6020 → MS/MSD for NR-SED-5 selenium 75%. at 64%/65%. Parent + pos → Lim
6020 → MS/MSD for NR-SED-14 <QC for AS (65%/66%) all pos, Lim Lead (71%/40%), Se (58%/60%)

9.0 Instrument Detection Limits (IDL)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?				✓			✓					

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓			✓								
10.2	Was a five-fold dilution performed?	✓			✓								
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).		✓			✓							

Note: [redacted]
6010 → Serial dilution for NR-SED-14 710%. for Iron at 106.5%. Pos J/s unless prev flagged for MB.
6020 → Serial dilution for NR-SED-14 Serial Dilution for NR-SED-14 Copper 13.4%, nickel 10.7%, Vanadium 10.8% and AS 14.6%. Pos → J/s unless prev. flagged.

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis? 5%.	✓			✓			✓					
	For sample results > 5 x RL, a control limit of 25% RPD for water and [redacted]% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.												
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report	✓			✓			✓					

Note: see attached.

[redacted]

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓			✓			✓					
12.2	Were all dilution reflected in the positive results and detection limits?	✓			✓			✓					
12.3	Were the Internal Standard recoveries within 30-120%	✓			✓								
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	✓											
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	✓											
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	✓											

Note:

13.0 Completeness Calculation		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓			✓			✓					
13.1.1	Number of samples:												
13.1.2	Number of target compounds in each analysis:												
13.1.3	Number of results rejected and not reported:												
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%												

Note:

NR-SED-17 and DUP-1

Method 6010

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total aluminum	mg/kg	10	50	11000	9400	15.7%	1600	40	P
total barium	mg/kg	1	5	110	110	0.0%	0	4	P
total beryllium	mg/kg	1	5	0.76	0.73	4.0%	0.03	4	P
total cadmium	mg/kg	2	10	1.2	1.2	0.0%	0	8	P
total calcium	mg/kg	50	250	2600	2400	8.0%	200	200	P
total chromium	mg/kg	5	25	17	19	11.1%	2	20	P
total cobalt	mg/kg	2	10	9.2	8.4	9.1%	0.8	8	P
total iron	mg/kg	10	50	31000	32000	3.2%	1000	40	P
total magnesium	mg/kg	50	250	2800	2800	0.0%	0	200	P
total manganese	mg/kg	1	5	470	700	39.3%	230	4	P
total potassium	mg/kg	50	250	1200	1100	8.7%	100	200	P
total zinc	mg/kg	5	25	450	470	4.3%	20	20	P

Control limit [sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

NR-SED-9 and DUP-2

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total aluminum	mg/kg	10	50	7900	7600	3.9%	300	40	P
total barium	mg/kg	1	5	100	110	9.5%	10	4	P
total beryllium	mg/kg	1	5	0.92	0.55	50.3%	0.37	4	P
total cadmium	mg/kg	2	10	2	1.3	20.7%	0.3	8	P
total calcium	mg/kg	50	250	1600	1700	6.1%	100	200	P
total chromium	mg/kg	5	25	18.0	16.0	11.8%	2	20	P
total cobalt	mg/kg	2	10	8.7	7.8	10.9%	1	8	P
total iron	mg/kg	10000	50000	79000	39000	67.8%	40000	40000	P
total magnesium	mg/kg	50	250	2000	1800	10.5%	200	200	P
total manganese	mg/kg	1	5	800	1000	22.2%	200	4	P
total potassium	mg/kg	50	250	850	860	1.2%	10	200	P
total zinc	mg/kg	5	25	550	540	1.8%	10	20	P

NR-SED-3 and DUP-3

Method 6010

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total aluminum	mg/kg	10	50	8200	11000	29.2%	2800	40	P
total barium	mg/kg	1	5	110	130	16.7%	20	4	P
total beryllium	mg/kg	1	5	0.56	0.87	43.4%	0.31	4	P
total cadmium	mg/kg	2	10	1	1.5	40.0%	0.5	8	P
total calcium	mg/kg	50	250	1100	1500	30.8%	400	200	P
total chromium	mg/kg	5	25	21.0	24.0	13.3%	3	20	P
total cobalt	mg/kg	2	10	7.1	10.0	33.9%	3	8	P
total iron	mg/kg	100	500	39000	39000	0.0%	0	400	P
total magnesium	mg/kg	50	250	1700	2400	34.1%	700	200	P
total manganese	mg/kg	1	5	1400	1600	13.3%	200	4	P
total potassium	mg/kg	50	250	820	1100	29.2%	280	200	P
total zinc	mg/kg	5	25	420	590	33.7%	170	20	P

Control limit [sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

NR-SED-17 and DUP-1

Method 6020

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total antimony	mg/kg	0.2	1.0	0.47	0.45	4.3%	0.02	0.8	P
total arsenic	mg/kg	0.1	0.5	2.5	2.3	8.3%	0.2	0.4	P
total copper	mg/kg	0.1	0.5	19	17	11.1%	2	0.4	P
total lead	mg/kg	1	5	110.00	110.00	0.0%	0	4	P
total nickel	mg/kg	0.1	0.5	12.0	11.0	8.7%	1	0.4	P
total selenium	mg/kg	0.2	1	0.31	0.18	53.1%	0.13	0.8	P
total silver	mg/kg	0.1	0.5	0.13	0.12	8.0%	0.01	0.4	P
total thallium	mg/kg	0.1	0.5	0.37	0.35	5.6%	0.02	0.4	P
total vanadium	mg/kg	0.1	0.5	20	20	0.0%	0	0.4	P

Control limit [sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

NR-SED-9 and DUP-2

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total antimony	mg/kg	0.2	1.0	1.10	1.70	42.9%	0.6	0.8	P
total arsenic	mg/kg	0.1	0.5	1.9	2.1	10.0%	0.2	0.4	P
total copper	mg/kg	0.1	0.5	16	21	27.0%	5	0.4	P
total lead	mg/kg	1	5	170.00	210.00	21.1%	40	4	P
total nickel	mg/kg	0.1	0.5	10.0	8.5	16.2%	1.5	0.4	P
total selenium	mg/kg	0.2	1	0.15	0.18	18.2%	0.03	0.8	P
total silver	mg/kg	0.1	0.5	0.11	0.10	9.5%	0	0.4	P
total thallium	mg/kg	0.1	0.5	0.46	0.41	11.5%	0.05	0.4	P
total vanadium	mg/kg	0.1	0.5	17	17	0.0%	0	0.4	P

NR-SED-3 and DUP-3

Method 6020

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total antimony	mg/kg	0.2	1.0	0.37	0.33	11.4%	0.04	0.8	P
total arsenic	mg/kg	0.1	0.5	2.5	2.6	3.9%	0.1	0.4	P
total copper	mg/kg	0.1	0.5	23	29	23.1%	6	0.4	P
total lead	mg/kg	1	5	160.00	160.00	0.0%	0	4	P
total nickel	mg/kg	0.1	0.5	13.0	13.0	0.0%	0	0.4	P
total selenium	mg/kg	0.2	1	0.14	0.12	15.4%	0.02	0.8	P
total silver	mg/kg	0.1	0.5	0.20	0.22	9.5%	0	0.4	P
total thallium	mg/kg	0.1	0.5	0.58	0.68	15.9%	0.1	0.4	P
total vanadium	mg/kg	0.1	0.5	22	23	4.4%	1	0.4	P

Control limit [sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

NR-SED-17 and DUP-1

Method 7471A

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total mercury	mg/kg	0.05	0.25	0.078	0.063	21.3%	0.015	0.2	P

Control limit [sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

NR-SED-9 and DUP-2

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total mercury	mg/kg	0.05	0.25	0.041	0.058	34.3%	0.017	0.2	P

NR-SED-3 and DUP-3

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
total mercury	mg/kg	0.05	0.25	0.084	0.130	43.0%	0.046	0.2	P

Control limit [sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Matrix: Soil
Laboratory ID: 0613731-BLK1
File ID: 6112201-020
Prepared: 11/21/06 07:00
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
Analyzed: 11/22/06 08:58
Instrument: 101
QC Batch: 0613731
Sequence: 6112201
Calibration: 6K22007

CAS No.	Analyte	MDL	MRL	Conc. (mg/kg dry wt.)	Q
7440-47-3	Chromium, Total	0.57	5.0	5.0	U
7439-89-6	Iron, Total	0.46	10	0.509	J

$Fe_{xs} = 2.545$

00436

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Matrix: Soil
Laboratory ID: 0613465-BLK1
File ID: 6111704-046
Prepared: 11/15/06 07:15
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
Analyzed: 11/17/06 11:56
Instrument: 101
QC Batch: 0613465
Sequence: 6111704
Calibration: 6K20016

CAS No.	Analyte	MDL	MRL	Conc. (mg/kg dry wt.)	Q
7429-90-5	Aluminum, Total	1.6	10	10	U
7440-39-3	Barium, Total	0.10	1.0	1.0	U
7440-41-7	Beryllium, Total	0.016	1.0	1.0	U
7440-43-9	Cadmium, Total	0.50	2.0	2.0	U
7440-70-2	Calcium, Total	10	50	50	U
7440-47-3	Chromium, Total	0.57	5.0	4.46	J
7440-48-4	Cobalt, Total	0.35	2.0	2.0	U
7439-95-4	Magnesium, Total	3.4	50	50	U
7439-96-5	Manganese, Total	0.14	1.0	0.334	J
7440-09-7	Potassium, Total	7.5	50	50	U
7440-23-5	Sodium, Total	19	100	100	U
7440-66-6	Zinc, Total	0.85	5.0	5.0	U

Cr x 5 = 22.3

Mn x 5 = 1.67

00429

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Matrix: Soil
Laboratory ID: 0613464-BLK1
File ID: 6111704-017
Prepared: 11/15/06 07:10
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
Analyzed: 11/17/06 09:32
Instrument: 101
QC Batch: 0613464
Sequence: 6111704
Calibration: 6K20016

CAS No.	Analyte	MDL	MRL	Conc. (mg/kg dry wt.)	Q
7429-90-5	Aluminum, Total	1.6	10	10	U
7440-39-3	Barium, Total	0.10	1.0	1.0	U
7440-41-7	Beryllium, Total	0.016	1.0	1.0	U
7440-43-9	Cadmium, Total	0.50	2.0	2.0	U
7440-70-2	Calcium, Total	10	50	50	U
7440-47-3	Chromium, Total	0.57	5.0	4.31	J
7440-48-4	Cobalt, Total	0.35	2.0	2.0	U
7439-89-6	Iron, Total	0.46	10	21.0	
7439-95-4	Magnesium, Total	3.4	50	50	U
7439-96-5	Manganese, Total	0.14	1.0	0.299	J
7440-09-7	Potassium, Total	7.5	50	50	U
7440-23-5	Sodium, Total	19	100	100	U
7440-66-6	Zinc, Total	0.85	5.0	1.18	J

Cr x5 = 21.55 mg/kg
Fe x5 = 105
Mn x5 = 1.495
Zn x5 = 5.9

00428

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Sequence: 6111704

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Instrument ID: 101
Calibration: 6K20016

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6111704-ICB1	Aluminum	-0.00616	0.10	0.016	mg/L	U	11/17/06 08:46
	Barium	-0.0000811	0.010	0.0010	mg/L	U	11/17/06 08:46
	Beryllium	-0.0000306	0.010	0.00016	mg/L	U	11/17/06 08:46
	Cadmium	-0.000723	0.020	0.0050	mg/L	U	11/17/06 08:46
	Calcium	0.00137	0.50	0.10	mg/L	U	11/17/06 08:46
	Chromium	0.00254	0.050	0.0057	mg/L	U	11/17/06 08:46
	Cobalt	0.0000406	0.020	0.0035	mg/L	U	11/17/06 08:46
	Iron	0.00167	0.10	0.0046	mg/L	U	11/17/06 08:46
	Magnesium	0.0152	0.50	0.034	mg/L	U	11/17/06 08:46
	Manganese	-0.000668	0.010	0.0014	mg/L	U	11/17/06 08:46
	Potassium	0.00422	0.50	0.075	mg/L	U	11/17/06 08:46
	Sodium	0.0805	1.0	0.19	mg/L	U	11/17/06 08:46
	Zinc	0.00153	0.050	0.0085	mg/L	U	11/17/06 08:46
6111704-CCB1	Aluminum	-0.00328	0.10	0.016	mg/L	U	11/17/06 09:27
Samples	Barium	-0.000387	0.010	0.0010	mg/L	U	11/17/06 09:27
NR-SED- 22,	Beryllium	-0.000152	0.010	0.00016	mg/L	U	11/17/06 09:27
23, 21, 20, 19	Cadmium	0.000283	0.020	0.0050	mg/L	U	11/17/06 09:27
18, 17, 16	Calcium	0.000631	0.50	0.10	mg/L	U	11/17/06 09:27
all 75%)	Chromium	0.00127	0.050	0.0057	mg/L	U	11/17/06 09:27
No Flags	Cobalt	0.000248	0.020	0.0035	mg/L	U	11/17/06 09:27
	Iron	0.00824	0.10	0.0046	mg/L	J	11/17/06 09:27
	Magnesium	0.0103	0.50	0.034	mg/L	U	11/17/06 09:27
	Manganese	-0.000666	0.010	0.0014	mg/L	U	11/17/06 09:27
	Potassium	0.0104	0.50	0.075	mg/L	U	11/17/06 09:27
	Sodium	0.0465	1.0	0.19	mg/L	U	11/17/06 09:27
	Zinc	-0.000300	0.050	0.0085	mg/L	U	11/17/06 09:27
0613464-BLK1	Aluminum, Total	10	10	1.6	mg/kg dry wt.	U	11/17/06 09:32
	Barium, Total	1.0	1.0	0.10	mg/kg dry wt.	U	11/17/06 09:32
	Beryllium, Total	1.0	1.0	0.016	mg/kg dry wt.	U	11/17/06 09:32
	Cadmium, Total	2.0	2.0	0.50	mg/kg dry wt.	U	11/17/06 09:32
	Calcium, Total	50	50	10	mg/kg dry wt.	U	11/17/06 09:32
	Chromium, Total	4.31	5.0	0.57	mg/kg dry wt.	J	11/17/06 09:32
	Cobalt, Total	2.0	2.0	0.35	mg/kg dry wt.	U	11/17/06 09:32

00416

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Sequence: 6111704

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Instrument ID: 101
Calibration: 6K20016

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
0613464-BLK1	Iron, Total	21.0	10	0.46	mg/kg dry wt.	*	11/17/06 09:32
	Magnesium, Total	50	50	3.4	mg/kg dry wt.	U	11/17/06 09:32
	Manganese, Total	0.299	1.0	0.14	mg/kg dry wt.	J	11/17/06 09:32
	Potassium, Total	50	50	7.5	mg/kg dry wt.	U	11/17/06 09:32
	Sodium, Total	100	100	19	mg/kg dry wt.	U	11/17/06 09:32
	Zinc, Total	1.18	5.0	0.85	mg/kg dry wt.	J	11/17/06 09:32
6111704-CCB2	Aluminum	0.000932	0.10	0.016	mg/L	U	11/17/06 10:27
NR-SED-15,	Barium	-0.000498	0.010	0.0010	mg/L	U	11/17/06 10:27
DUP-1, SED-14	Beryllium	-0.0000499	0.010	0.00016	mg/L	U	11/17/06 10:27
-13, -12, -11	Cadmium	-0.0000523	0.020	0.0050	mg/L	U	11/17/06 10:27
all TSK1	Calcium	0.00352	0.50	0.10	mg/L	U	11/17/06 10:27
DO #1995	Chromium	0.00245	0.050	0.0057	mg/L	U	11/17/06 10:27
	Cobalt	0.000247	0.020	0.0035	mg/L	U	11/17/06 10:27
	Iron	0.00563	0.10	0.0046	mg/L	J	11/17/06 10:27
	Magnesium	-0.00918	0.50	0.034	mg/L	U	11/17/06 10:27
	Manganese	-0.000498	0.010	0.0014	mg/L	U	11/17/06 10:27
	Potassium	0.0209	0.50	0.075	mg/L	U	11/17/06 10:27
	Sodium	-0.0648	1.0	0.19	mg/L	U	11/17/06 10:27
	Zinc	-0.000302	0.050	0.0085	mg/L	U	11/17/06 10:27
6111704-CCB3	Aluminum	0.000238	0.10	0.016	mg/L	U	11/17/06 11:26
NR-SED-10,	Barium	-0.000428	0.010	0.0010	mg/L	U	11/17/06 11:26
-9, -8,	Beryllium	-0.00000800	0.010	0.00016	mg/L	U	11/17/06 11:26
DUP-2, -6,	Cadmium	-0.000498	0.020	0.0050	mg/L	U	11/17/06 11:26
-5,	Calcium	0.00568	0.50	0.10	mg/L	U	11/17/06 11:26
	Chromium	0.00369	0.050	0.0057	mg/L	U	11/17/06 11:26
	Cobalt	-0.000912	0.020	0.0035	mg/L	U	11/17/06 11:26
	Iron	0.00643	0.10	0.0046	mg/L	J	11/17/06 11:26
	Magnesium	0.00802	0.50	0.034	mg/L	U	11/17/06 11:26
	Manganese	-0.000679	0.010	0.0014	mg/L	U	11/17/06 11:26
	Potassium	0.0139	0.50	0.075	mg/L	U	11/17/06 11:26
	Sodium	-0.147	1.0	0.19	mg/L	U	11/17/06 11:26
	Zinc	-0.000790	0.050	0.0085	mg/L	U	11/17/06 11:26
0613465-BLK1	Aluminum, Total	10	10	1.6	mg/kg dry wt.	U	11/17/06 11:56

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Sequence: 6111704

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Instrument ID: 101
Calibration: 6K20016

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
0613465-BLK1	Barium, Total	1.0	1.0	0.10	mg/kg dry wt.	U	11/17/06 11:56
	Beryllium, Total	1.0	1.0	0.016	mg/kg dry wt.	U	11/17/06 11:56
	Cadmium, Total	2.0	2.0	0.50	mg/kg dry wt.	U	11/17/06 11:56
	Calcium, Total	50	50	10	mg/kg dry wt.	U	11/17/06 11:56
	Chromium, Total	4.46	5.0	0.57	mg/kg dry wt.	J	11/17/06 11:56
	Cobalt, Total	2.0	2.0	0.35	mg/kg dry wt.	U	11/17/06 11:56
	Magnesium, Total	50	50	3.4	mg/kg dry wt.	U	11/17/06 11:56
	Manganese, Total	0.334	1.0	0.14	mg/kg dry wt.	J	11/17/06 11:56
	Potassium, Total	50	50	7.5	mg/kg dry wt.	U	11/17/06 11:56
	Sodium, Total	100	100	19	mg/kg dry wt.	U	11/17/06 11:56
	Zinc, Total	5.0	5.0	0.85	mg/kg dry wt.	U	11/17/06 11:56
6111704-CCB4	Aluminum	0.0102	0.10	0.016	mg/L	U	11/17/06 12:27
	Barium XS=0.00555	-0.00111	0.010	0.0010	mg/L	J	11/17/06 12:27
NR-SED-3,	Beryllium	0.0000279	0.010	0.00016	mg/L	U	11/17/06 12:27
-2, -1, -4	Cadmium	-0.000488	0.020	0.0050	mg/L	U	11/17/06 12:27
-7, DUP-3	Calcium	0.00198	0.50	0.10	mg/L	U	11/17/06 12:27
	Chromium XS=0.0302	0.00604	0.050	0.0057	mg/L	J	11/17/06 12:27
All 75x1	Cobalt	0.000475	0.020	0.0035	mg/L	U	11/17/06 12:27
No flags	Iron XS=0.0256	0.00512	0.10	0.0046	mg/L	J	11/17/06 12:27
	Magnesium	0.00499	0.50	0.034	mg/L	U	11/17/06 12:27
	Manganese	-0.000580	0.010	0.0014	mg/L	U	11/17/06 12:27
	Potassium	-0.0138	0.50	0.075	mg/L	U	11/17/06 12:27
	Sodium XS=-1.47	-0.294	1.0	0.19	mg/L	J	11/17/06 12:27
	Zinc	0.000615	0.050	0.0085	mg/L	U	11/17/06 12:27
6111704-CCB5	Aluminum	0.0131	0.10	0.016	mg/L	U	11/17/06 13:22
	Barium	-0.000934	0.010	0.0010	mg/L	U	11/17/06 13:22
NR-SED-14	Beryllium	0.00000190	0.010	0.00016	mg/L	U	11/17/06 13:22
	Cadmium	-0.000576	0.020	0.0050	mg/L	U	11/17/06 13:22
prev. B, P	Calcium	0.00353	0.50	0.10	mg/L	U	11/17/06 13:22
	Chromium	0.00556	0.050	0.0057	mg/L	U	11/17/06 13:22
	Cobalt	0.00330	0.020	0.0035	mg/L	U	11/17/06 13:22
	Iron	0.00530	0.10	0.0046	mg/L	J	11/17/06 13:22
	Magnesium	-0.00504	0.50	0.034	mg/L	U	11/17/06 13:22

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Sequence: 6111704
Instrument ID: 101
Calibration: 6K20016

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6111704-CCB5	Manganese	-0.000520	0.010	0.0014	mg/L	U	11/17/06 13:22
	Potassium	-0.00606	0.50	0.075	mg/L	U	11/17/06 13:22
	Sodium	-0.253	1.0	0.19	mg/L	J	11/17/06 13:22
	Zinc	-0.000843	0.050	0.0085	mg/L	U	11/17/06 13:22
6111704-CCB6	Aluminum	0.00435	0.10	0.016	mg/L	U	11/17/06 14:23
	Barium	-0.00109	0.010	0.0010	mg/L	J	11/17/06 14:23
	Beryllium	-0.0000149	0.010	0.00016	mg/L	U	11/17/06 14:23
	Cadmium	-0.000655	0.020	0.0050	mg/L	U	11/17/06 14:23
	Calcium	0.00217	0.50	0.10	mg/L	U	11/17/06 14:23
	Chromium	0.00525	0.050	0.0057	mg/L	U	11/17/06 14:23
	Cobalt	0.00148	0.020	0.0035	mg/L	U	11/17/06 14:23
	Iron	0.00553	0.10	0.0046	mg/L	J	11/17/06 14:23
	Magnesium	0.00834	0.50	0.034	mg/L	U	11/17/06 14:23
	Manganese	-0.000771	0.010	0.0014	mg/L	U	11/17/06 14:23
	Potassium	-0.000229	0.50	0.075	mg/L	U	11/17/06 14:23
	Sodium	-0.240	1.0	0.19	mg/L	J	11/17/06 14:23
	Zinc	-0.000190	0.050	0.0085	mg/L	U	11/17/06 14:23
6111704-CCB7	Aluminum	0.00102	0.10	0.016	mg/L	U	11/17/06 15:20
	Barium	-0.000748	0.010	0.0010	mg/L	U	11/17/06 15:20
	Beryllium	0.0000150	0.010	0.00016	mg/L	U	11/17/06 15:20
	Cadmium	-0.000272	0.020	0.0050	mg/L	U	11/17/06 15:20
	Calcium	0.00431	0.50	0.10	mg/L	U	11/17/06 15:20
	Chromium	0.000921	0.050	0.0057	mg/L	U	11/17/06 15:20
	Cobalt	0.00261	0.020	0.0035	mg/L	U	11/17/06 15:20
	Iron	0.00556	0.10	0.0046	mg/L	J	11/17/06 15:20
	Magnesium	0.0157	0.50	0.034	mg/L	U	11/17/06 15:20
	Manganese	-0.000892	0.010	0.0014	mg/L	U	11/17/06 15:20
	Potassium	-0.0243	0.50	0.075	mg/L	U	11/17/06 15:20
	Sodium	-0.172	1.0	0.19	mg/L	U	11/17/06 15:20
	Zinc	-0.00112	0.050	0.0085	mg/L	U	11/17/06 15:20

* Values outside of QC limits

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Sequence: 6112201
Instrument ID: 101
Calibration: 6K22007

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6112201-ICB1	Barium	0.000156	0.010	0.0010	mg/L	U	11/22/06 08:00
	Chromium	0.000883	0.050	0.0057	mg/L	U	11/22/06 08:00
	Iron	0.000363	0.10	0.0046	mg/L	U	11/22/06 08:00
6112201-CCB1	Barium	0.000149	0.010	0.0010	mg/L	U	11/22/06 08:28
	Chromium	-0.00188	0.050	0.0057	mg/L	U	11/22/06 08:28
	Iron	0.000776	0.10	0.0046	mg/L	U	11/22/06 08:28
0613731-BLK1	Chromium, Total	5.0	5.0	0.57	mg/kg dry wt.	U	11/22/06 08:58
	Iron, Total	0.509	10	0.46	mg/kg dry wt.	J	11/22/06 08:58
6112201-CCB2	Barium	-0.0000931	0.010	0.0010	mg/L	U	11/22/06 09:26
	Chromium	-0.00255	0.050	0.0057	mg/L	U	11/22/06 09:26
	Iron	0.00189	0.10	0.0046	mg/L	U	11/22/06 09:26
6112201-CCB3	Barium	-0.000125	0.010	0.0010	mg/L	U	11/22/06 10:15
	Chromium	-0.000532	0.050	0.0057	mg/L	U	11/22/06 10:15
	Iron	0.00219	0.10	0.0046	mg/L	U	11/22/06 10:15
0613750-BLK1	Chromium, Total	5.0	5.0	0.57	mg/kg dry wt.	U	11/22/06 10:46
6112201-CCB4	Barium	0.0000591	0.010	0.0010	mg/L	U	11/22/06 11:15
-17, -16, 15	Chromium	0.00330	0.050	0.0057	mg/L	U	11/22/06 11:15
DUP-1 -14	Iron XS=0.02345	0.00469	0.10	0.0046	mg/L	J	11/22/06 11:15
6112201-CCB5	Barium	-0.0000932	0.010	0.0010	mg/L	U	11/22/06 12:11
	Chromium	0.00199	0.050	0.0057	mg/L	U	11/22/06 12:11
	Iron	0.00390	0.10	0.0046	mg/L	U	11/22/06 12:11
6112201-CCB6	Barium	-0.000126	0.010	0.0010	mg/L	U	11/22/06 13:00
NR-SED-5	Chromium	0.00420	0.050	0.0057	mg/L	U	11/22/06 13:00
JSx No flags	Iron	0.00518	0.10	0.0046	mg/L	J	11/22/06 13:00
6112201-CCB7	Barium	0.000268	0.010	0.0010	mg/L	U	11/22/06 13:19
	Chromium	0.000632	0.050	0.0057	mg/L	U	11/22/06 13:19
	Iron	0.00534	0.10	0.0046	mg/L	J	11/22/06 13:19

* Values outside of QC limits

No flags

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-6010B

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Initial/Final: 0.5005 g / 50 mL

Laboratory ID: 0613464-MS1
QC Batch: 0613464

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Aluminum, Total	125	7190	8740	1250 * OKV	80 - 120	mg/kg dry wt.
Barium, Total	25.0	74.9	93.5	75 * OK	80 - 120	mg/kg dry wt.
Beryllium, Total	2.50	0.610	2.89	91	80 - 120	mg/kg dry wt.
Cadmium, Total	25.0	0.954	23.6	91	80 - 120	mg/kg dry wt.
Calcium, Total	1250	1540	4670	251 *	80 - 120	mg/kg dry wt.
Cobalt, Total	25.0	5.50	27.7	89	80 - 120	mg/kg dry wt.
Iron, Total	25.0	35400	25900	-37900 * OKV	80 - 120	mg/kg dry wt.
Magnesium, Total	1250	1860	4300	196 *	80 - 120	mg/kg dry wt.
Manganese, Total	25.0	325	330	18 * OKV	80 - 120	mg/kg dry wt.
Potassium, Total	1250	874	2070	96	80 - 120	mg/kg dry wt.
Sodium, Total	1250	ND	1150	92	80 - 120	mg/kg dry wt.
Zinc, Total	25.0	341	362	84	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

OKV → Sample conc. > 4x Spike added

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-6010B

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL

Laboratory ID: 0613464-MSD1
QC Batch: 0613464

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Aluminum, Total	125	9670	1990 * OKV	10	20	80 - 120	mg/kg dry wt.
Barium, Total	25.0	100	101	7	20	80 - 120	mg/kg dry wt.
Beryllium, Total	2.50	2.91	92	0.8	20	80 - 120	mg/kg dry wt.
Cadmium, Total	25.0	23.5	90	0.2	20	80 - 120	mg/kg dry wt.
Calcium, Total	1250	2880	107	48 *	20	80 - 120	mg/kg dry wt.
Cobalt, Total	25.0	28.1	90	2	20	80 - 120	mg/kg dry wt.
Iron, Total	25.0	25800	-38100 * OKV	0.3	20	80 - 120	mg/kg dry wt.
Magnesium, Total	1250	3290	115	27 *	20	80 - 120	mg/kg dry wt.
Manganese, Total	25.0	300	-101 * OKV	9	20	80 - 120	mg/kg dry wt.
Potassium, Total	1250	2170	103	4	20	80 - 120	mg/kg dry wt.
Sodium, Total	1250	1150	92	0.2	20	80 - 120	mg/kg dry wt.
Zinc, Total	25.0	336	-18 * OKV	7	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

OK → Sample Conc. > 4X spike amt.

00433

SERIAL DILUTION
USEPA-6010B

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Matrix: Soil
% Solids:
Laboratory ID: 6111704-SRD3
QC Batch: 6111704
Lab Source ID: 0611283-11
Sequence: 6111704

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Iron, Total	0.707		1.46		106.5	*	mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

00459

Quality Control Results – ICP Metals

Calibration

All instrument calibrations and continuing calibrations were method-compliant. Note: instrument reports for ICP include the listing of initial calibration correlation coefficients and internal standard recoveries; those values may either be imbedded with raw data from each run or included as a summary (also within the instrument printout).

Note: TriMatrix interprets the QSM requirement for a "low-level calibration check standard" as one pertaining to a one-point initial calibration. Given that a multi-point initial calibration was performed, the specification for a low-level calibration check either does not apply or has been satisfied since the lowest calibration standard is equivalent in concentration to the reporting limit.

Method Blanks

Chromium was detected at a concentration above one-half the RL (but below the RL) in both initial method blanks. Samples with concentrations greater than five times the associated method blank were redigested. The method blanks associated with the redigested samples were non-detect for Chromium. Except for the two initial method blanks, historical blank data for the period July, 2006 through December, 2006 shows a background level of Chromium consistently less than 1 mg/Kg.

Iron was detected at a concentration above the RL in one of the initial method blanks. Samples with concentrations greater than five times the associated method blank were redigested. Iron was detected at a J-level concentration (but below one-half the RL) in the method blank associated with the redigested samples.

Manganese was detected at a concentration less than or equal to one-half the RL in both initial method blanks. Zinc was detected at a concentration less than or equal to one-half the RL in one of the initial method blanks.

Internal Standard Response

Internal standard responses for all standards, samples, and quality control samples were method-compliant.

Laboratory Control Sample

All Laboratory Control Sample recoveries were in control.

Matrix Spikes

Samples 'NR-SED-14' and 'NR-SED-5' were fortified with all target analytes. See the MS/MSD summaries and Statements of Data Qualification for details.

Serial Dilutions and Post-Digestion Spikes

Serial dilution (SD) and post-digestion spike (PDS) analysis was performed on the samples employed for MS/MSD analysis. One SD value for Iron in sample 'NR-SED-14' exceeded criterion; see Serial Dilution summaries and Statements of Data Qualification for details. All PDS values were in control.

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Individual sample results relate only to the sample tested.

Quality Control Results – ICP Metals – (continued)

Sample Results

Please see Section C of the data package.

Note: for all soil samples for metals analysis, a representative subsample is dried and a smaller measured amount of that dried subsample is then digested. Unlike most other parameters for a soil sample that are processed on a wet-weight basis, a Percent Solids value (if determined) for the sample is not applied to the MDL, RL, or to the result.

Statements of Data Qualification

See Narrative Attachment 2.

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Individual sample results relate only to the sample tested.

Quality Control Results – ICP/MS Metals

Calibration

All instrument calibrations and continuing calibrations were method-compliant. Note: instrument reports for ICPMS include the listing of initial calibration correlation coefficients and internal standard recoveries; those values may either be imbedded with raw data from each run or included as a summary (also within the instrument printout).

Note: TriMatrix interprets the QSM requirement for a "low-level calibration check standard" as one pertaining to a one-point initial calibration. Given that a multi-point initial calibration was performed, the specification for a low-level calibration check either does not apply or has been satisfied since the lowest calibration standard is equivalent in concentration to the reporting limit.

Method Blanks

Lead was detected at a concentration above one-half the RL (but below the RL) in one of the initial method blanks. All associated samples that were found to contain Lead had concentrations greater than five times the associated method blank and they were not redigested.

Vanadium was detected at a concentration above one-half the RL (but below the RL) in one of the initial method blanks. All associated samples that were found to contain Vanadium had concentrations greater than five times the associated method blank and were not redigested. Vanadium was detected at a concentration below one-half the RL in the other method blank.

Internal Standard Response

Internal standard responses for all standards, samples, and quality control samples were method-compliant.

Laboratory Control Sample

All Laboratory Control Sample recoveries were in control.

Matrix Spike

Sample 'NR-SED-5' was fortified with all target analytes. See the MS/MSD summaries and Statements of Data Qualification for details.

Sample 'NR-SED-14' was fortified with all target analytes. See the MS/MSD summaries and Statements of Data Qualification for details.

Serial Dilutions and Post-Digestion Spikes

Serial dilution (SD) and post-digestion spike (PDS) analysis was performed on the samples employed for MS/MSD analysis. Several SD values exceeded criterion; see Serial Dilution summaries and Statements of Data Qualification for details. All PDS values were in control.

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Individual sample results relate only to the sample tested.

Quality Control Results – ICP/MS Metals – (continued)

Sample Results

Please see Section C of the data package.

Note: for all soil samples for metals analysis, a representative subsample is dried and a smaller measured amount of that dried subsample is then digested. Unlike most other parameters for a soil sample that are processed on a wet-weight basis, a Percent Solids value (if determined) for the sample is not applied to the MDL, RL, or to the result.

Statements of Data Qualification

See Narrative Attachment 2.

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Individual sample results relate only to the sample tested.

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Matrix: Soil
Laboratory ID: 0613466-BLK1
File ID: 6112027-043
Prepared: 11/15/06 07:15
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 250 mL
Analyzed: 11/21/06 12:56
Instrument: 114
QC Batch: 0613466
Sequence: 6112027
Calibration: 6K21018

CAS No.	Analyte	MDL	MRL	Conc. (mg/kg dry wt.)	Q
7440-50-8	Copper, Total	0.022	0.10	0.10	U
7439-92-1	Lead, Total	0.041	0.20	0.20	U
7440-02-0	Nickel, Total	0.027	0.10	0.10	U
7440-22-4	Silver, Total	0.017	0.10	0.10	U
7440-28-0	Thallium, Total	0.0085	0.10	0.10	U
7440-62-2	Vanadium, Total	0.024	0.10	0.0610	J

V x 5 = 0.305

all 75x

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Matrix: Soil
Laboratory ID: 0613493-BLK1
File ID: 6112027-014
Prepared: 11/16/06 07:05
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 250 mL
Analyzed: 11/21/06 11:01
Instrument: 114
QC Batch: 0613493
Sequence: 6112027
Calibration: 6K21018

CAS No.	Analyte	MDL	MRL	Conc. (mg/kg dry wt.)	Q
7440-38-2	Arsenic, Total	0.023	0.10	0.10	U
7440-50-8	Copper, Total	0.022	0.10	0.10	U
7439-92-1	Lead, Total	0.041	0.20	0.128	J
7440-02-0	Nickel, Total	0.027	0.10	0.10	U
7782-49-2	Selenium, Total	0.063	0.20	0.20	U
7440-22-4	Silver, Total	0.017	0.10	0.10	U
7440-28-0	Thallium, Total	0.0085	0.10	0.10	U
7440-62-2	Vanadium, Total	0.024	0.10	0.0355	J

Pb x 5 = 0.64
V x 5 = 0.1775

all 75 x

00947

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Sequence: 6112027
Instrument ID: 114
Calibration: 6K21018

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6112027-CCB3	Copper	0.0000210	0.00020	0.000045	mg/L	U	11/21/06 12:33
	Lead	0.000126	0.00040	0.000083	mg/L	J	11/21/06 12:33
	Nickel	0.0000100	0.00020	0.000055	mg/L	U	11/21/06 12:33
	Selenium	-0.0000990	0.00040	0.00013	mg/L	U	11/21/06 12:33
	Silver	0.00000300	0.00020	0.000035	mg/L	U	11/21/06 12:33
	Thallium	0.00000400	0.00020	0.000017	mg/L	U	11/21/06 12:33
	Vanadium	0.0000670	0.00020	0.000047	mg/L	J	11/21/06 12:33
0613466-BLK1	Copper, Total	0.10	0.10	0.022	mg/kg dry wt.	U	11/21/06 12:56
	Lead, Total	0.20	0.20	0.041	mg/kg dry wt.	U	11/21/06 12:56
	Nickel, Total	0.10	0.10	0.027	mg/kg dry wt.	U	11/21/06 12:56
	Silver, Total	0.10	0.10	0.017	mg/kg dry wt.	U	11/21/06 12:56
	Thallium, Total	0.10	0.10	0.0085	mg/kg dry wt.	U	11/21/06 12:56
	Vanadium, Total	0.0610	0.10	0.024	mg/kg dry wt.	J	11/21/06 12:56
6112027-CCB4	Copper	0.0000220	0.00020	0.000045	mg/L	U	11/21/06 13:24
	Lead	0.000126	0.00040	0.000083	mg/L	J	11/21/06 13:24
	Nickel	0.00000600	0.00020	0.000055	mg/L	U	11/21/06 13:24
ALL 75X	Selenium X5 = -0.00113	-0.000226	0.00040	0.00013	mg/L	J	11/21/06 13:24
	Silver	0.00000300	0.00020	0.000035	mg/L	U	11/21/06 13:24
	Thallium	0.00000300	0.00020	0.000017	mg/L	U	11/21/06 13:24
	Vanadium	0.0000560	0.00020	0.000047	mg/L	J	11/21/06 13:24
6112027-CCB5	Copper	0.0000390	0.00020	0.000045	mg/L	U	11/21/06 14:16
	Lead	0.000128	0.00040	0.000083	mg/L	J	11/21/06 14:16
	Nickel	0.00000900	0.00020	0.000055	mg/L	U	11/21/06 14:16
	Silver	0.00000900	0.00020	0.000035	mg/L	U	11/21/06 14:16
	Thallium	0.00000500	0.00020	0.000017	mg/L	U	11/21/06 14:16
	Vanadium	0.0000130	0.00020	0.000047	mg/L	U	11/21/06 14:16
6112027-CCB6	Copper	0.0000200	0.00020	0.000045	mg/L	U	11/21/06 14:29
	Lead	0.000124	0.00040	0.000083	mg/L	J	11/21/06 14:29
6112027-CCB7	Copper	0.0000200	0.00020	0.000045	mg/L	U	11/21/06 14:57
>5X ✓	Lead	0.000123	0.00040	0.000083	mg/L	J	11/21/06 14:57
6112027-CCB8	Copper	0.0000190	0.00020	0.000045	mg/L	U	11/21/06 15:26
>5X ✓	Lead	0.000123	0.00040	0.000083	mg/L	J	11/21/06 15:26
6112027-CCB9	Copper	0.0000190	0.00020	0.000045	mg/L	U	11/21/06 15:53

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Sequence: 6112027

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Instrument ID: 114
Calibration: 6K21018

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6112027-CCB9	Lead	0.000123	0.00040	0.000083	mg/L	J	11/21/06 15:53

* Values outside of QC limits

00933

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Sequence: 6112202

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Instrument ID: 114
Calibration: 6K22003

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6112202-ICB1	Arsenic X5=0.00022	0.0000440	0.00020	0.000046	mg/L	U	11/22/06 08:02
	Selenium	0.0000310	0.00040	0.00013	mg/L	U	11/22/06 08:02
6112202-CCB1	Arsenic X5=0.000285	0.0000570	0.00020	0.000046	mg/L	J	11/22/06 08:13
	Selenium	0.0000880	0.00040	0.00013	mg/L	U	11/22/06 08:13
0613466-BLK2	Arsenic, Total	0.10	0.10	0.023	mg/kg dry wt.	U	11/22/06 08:15
	Selenium, Total	0.20	0.20	0.063	mg/kg dry wt.	U	11/22/06 08:15
6112202-CCB2	Arsenic X5=0.0003	0.0000610	0.00020	0.000046	mg/L	J	11/22/06 08:44
	Selenium	-0.0000190	0.00040	0.00013	mg/L	U	11/22/06 08:44
6112202-CCB3	Arsenic	0.0000280	0.00020	0.000046	mg/L	U	11/22/06 08:57
	Selenium	-0.0000340	0.00040	0.00013	mg/L	U	11/22/06 08:57

* Values outside of QC limits

all 7 5x

00935

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-29
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Sequence: 6112203
Instrument ID: 114
Calibration: 6K22005

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6112203-ICB1	Antimony X5 = 0.00415	0.0000830	0.00040	0.000071	mg/L	J	11/22/06 10:49
6112203-CCB1	Antimony	0.0000100	0.00040	0.000071	mg/L	U	11/22/06 10:59
0613626-BLK1	Antimony, Total	0.20	0.20	0.036	mg/kg dry wt.	U	11/22/06 11:02
6112203-CCB2	Antimony	-0.0000770	0.00040	0.000071	mg/L	J	11/22/06 11:30
6112203-CCB3	Antimony	-0.000102	0.00040	0.000071	mg/L	J	11/22/06 12:01
0613548-BLK1	Antimony, Total X5 = 1	0.20	0.20	0.036	mg/kg dry wt.	J	11/22/06 12:15
6112203-CCB4	Antimony X5 = 0.00053	-0.000106	0.00040	0.000071	mg/L	J	11/22/06 12:28
6112203-CCB5	Antimony X5 = 0.00056	-0.000112	0.00040	0.000071	mg/L	J	11/22/06 12:49

* Values outside of QC limits

< 5X B IP

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Sequence: 6112027

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Instrument ID: 114
Calibration: 6K21018

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6112027-ICB1	Arsenic	0.0000370	0.00020	0.000046	mg/L	U	11/21/06 10:41
	Copper	0.00000300	0.00020	0.000045	mg/L	U	11/21/06 10:41
	Lead	-0.00000100	0.00040	0.000083	mg/L	U	11/21/06 10:41
	Nickel	-0.00000600	0.00020	0.000055	mg/L	U	11/21/06 10:41
	Selenium	0.0000950	0.00040	0.00013	mg/L	U	11/21/06 10:41
	Silver	0.00000600	0.00020	0.000035	mg/L	U	11/21/06 10:41
	Thallium	0.00000200	0.00020	0.000017	mg/L	U	11/21/06 10:41
	Vanadium	-0.00000500	0.00020	0.000047	mg/L	U	11/21/06 10:41
6112027-CCB1	Arsenic	0.00000700	0.00020	0.000046	mg/L	U	11/21/06 10:57
	Copper	0.00000200	0.00020	0.000045	mg/L	U	11/21/06 10:57
	Lead	-0.00000200	0.00040	0.000083	mg/L	U	11/21/06 10:57
	Nickel	-0.00000300	0.00020	0.000055	mg/L	U	11/21/06 10:57
	Selenium	0.0000170	0.00040	0.00013	mg/L	U	11/21/06 10:57
	Silver	0.00000500	0.00020	0.000035	mg/L	U	11/21/06 10:57
	Thallium	0.00000200	0.00020	0.000017	mg/L	U	11/21/06 10:57
	Vanadium	0.0000230	0.00020	0.000047	mg/L	U	11/21/06 10:57
0613493-BLK1	Arsenic, Total	0.10	0.10	0.023	mg/kg dry wt.	U	11/21/06 11:01
	Copper, Total	0.10	0.10	0.022	mg/kg dry wt.	U	11/21/06 11:01
	Lead, Total	0.128	0.20	0.041	mg/kg dry wt.	J	11/21/06 11:01
	Nickel, Total	0.10	0.10	0.027	mg/kg dry wt.	U	11/21/06 11:01
	Selenium, Total	0.20	0.20	0.063	mg/kg dry wt.	U	11/21/06 11:01
	Silver, Total	0.10	0.10	0.017	mg/kg dry wt.	U	11/21/06 11:01
	Thallium, Total	0.10	0.10	0.0085	mg/kg dry wt.	U	11/21/06 11:01
	Vanadium, Total	0.0355	0.10	0.024	mg/kg dry wt.	J	11/21/06 11:01
6112027-CCB2	Arsenic	-0.00000700	0.00020	0.000046	mg/L	U	11/21/06 11:44
	Copper	0.0000190	0.00020	0.000045	mg/L	U	11/21/06 11:44
	Lead	0.000128	0.00040	0.000083	mg/L	J	11/21/06 11:44
	Nickel	0.00000900	0.00020	0.000055	mg/L	U	11/21/06 11:44
	Selenium	0.00	0.00040	0.00013	mg/L	U	11/21/06 11:44
	Silver	0.00000300	0.00020	0.000035	mg/L	U	11/21/06 11:44
	Thallium	0.00000400	0.00020	0.000017	mg/L	U	11/21/06 11:44
	Vanadium	0.0000800	0.00020	0.000047	mg/L	J	11/21/06 11:44
6112027-CCB3	Arsenic	-0.0000460	0.00020	0.000046	mg/L	J	11/21/06 12:33

00931

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

NR-SED-5

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Soil

SDG: 36440-29

Project: RFAAP SWMU 54 RFI/CMS

Preparation: 3050B Digestion

Initial/Final: 0.5 g / 250 mL

QC Batch: 0613466

Laboratory ID: 0613466-MS2

OK Recovery (1) 75-125%

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Arsenic, Total	20.0	6.15	21.9	79 *	80 - 120	mg/kg dry wt.
Selenium, Total	20.0	0.634	13.8	66 *	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-6020A

NR-SED-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 250 mL

Laboratory ID: 0613466-MSD2
QC Batch: 0613466

Analyte	Spike Added	MSD Conc.	MSD % Rec. #		% RPD #	QC Limits RPD	QC Limits Rec.	Units
Arsenic, Total	20.0	21.4	76	*	2	20	80 - 120	mg/kg dry wt.
Selenium, Total	20.0	13.6	65	*	1	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00953

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Initial/Final: 0.5003 g / 250 mL

Laboratory ID: 0613493-MS1
QC Batch: 0613493

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Arsenic, Total	20.0	1.60	14.7	65 *	80 - 120	mg/kg dry wt.
Copper, Total	20.0	8.60	26.4	89	80 - 120	mg/kg dry wt.
Lead, Total	20.0	86.4	101	71 *	80 - 120	mg/kg dry wt.
Nickel, Total	20.0	7.95	26.5	93	80 - 120	mg/kg dry wt.
Selenium, Total	20.0	0.165	11.8	58 *	80 - 120	mg/kg dry wt.
Silver, Total	20.0	0.0810	19.3	96	75 - 120	mg/kg dry wt.
Thallium, Total	20.0	0.266	19.2	95	80 - 120	mg/kg dry wt.
Vanadium, Total	20.0	15.3	35.7	102	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00954

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-6020A

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Initial/Final: 0.5005 g / 250 mL

Laboratory ID: 0613493-MSD1
QC Batch: 0613493

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Arsenic, Total	20.0	14.8	66 *	1	20	80 - 120	mg/kg dry wt.
Copper, Total	20.0	28.7	100	8	20	80 - 120	mg/kg dry wt.
Lead, Total	20.0	94.3	40 *	6	20	80 - 120	mg/kg dry wt.
Nickel, Total	20.0	26.3	92	0.8	20	80 - 120	mg/kg dry wt.
Selenium, Total	20.0	12.1	60 *	2	20	80 - 120	mg/kg dry wt.
Silver, Total	20.0	19.2	96	0.3	20	75 - 120	mg/kg dry wt.
Thallium, Total	20.0	19.4	96	1	20	80 - 120	mg/kg dry wt.
Vanadium, Total	20.0	35.2	100	1	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00955

SERIAL DILUTION

USEPA-6020A

NR-SED-5

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Soil

% Solids:

Laboratory ID: 6112202-SRD1

Lab Source ID: 0611283-20

SDG: 36440-29

Project: RFAAP SWMU 54 RFI/CMS

QC Batch: 6112202

Sequence: 6112202

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Arsenic, Total	0.0123		0.0141		14.6	*	mg/L	10
Selenium, Total	0.00127		0.00166	J	30.7 #		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

00976

SERIAL DILUTION

USEPA-6020A

NR-SED-14

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Soil

% Solids:

Laboratory ID: 6112027-SRD1

Lab Source ID: 0611283-11

SDG: 36440-29

Project: RFAAP SWMU 54 RFI/CMS

QC Batch: 6112027

Sequence: 6112027

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Arsenic, Total	0.00321		0.00345		7.5 #		mg/L	10
Copper, Total	0.0172		0.0195		13.4	*	mg/L	10
Nickel, Total	0.0159		0.0176		10.7	*	mg/L	10
Selenium, Total	0.000330	J	0.000190	U	42.4 #		mg/L	10
Silver, Total	0.000162	J	0.000190	J	17.3 #		mg/L	10
Thallium, Total	0.000531		0.000580	J	9.2 #		mg/L	10
Vanadium, Total	0.0306		0.0339		10.8	*	mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

Quality Control Results – Mercury (CVAA)

Calibration

Instrument calibration and continuing calibrations were method-compliant.

Method Blanks

Mercury was not detected at a concentration above one-half the RL.

Laboratory Control Samples

The Laboratory Control Sample recoveries were in control.

Matrix Spikes

Sample 'NR-SED-5' was fortified. Both recoveries and RPD were in control.

Sample 'NR-SED-14' was fortified. Both recoveries and RPD were in control.

Serial Dilutions and Post-Digestion Spikes

Not applicable.

Sample Results

Please see Section C of the data package.

Note: for all soil samples for metals analysis, a representative subsample is dried and a smaller measured amount of that dried subsample is then digested. Unlike most other parameters for a soil sample that are processed on a wet-weight basis, a Percent Solids value (if determined) for the sample is not applied to the MDL, RL, or to the result.

Statements of Data Qualification

There were no statements generated.

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Individual sample results relate only to the sample tested.

Data Review and Approval

All data was reviewed and approved by the group supervisor/manager prior to further review by data management staff and the project chemist.

Data Deliverables

The data deliverables, both hardcopy and electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD has been issued separate from this hardcopy report.

Walt Roudebush, Project Chemist

1/9/07
Date

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Individual sample results relate only to the sample tested.

BLANKS
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Sequence: 6111721

SDG: 36440-29
Project: RFAAP SWMU 54 RFI/CMS
Instrument ID: 216
Calibration: 6K17005

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
6111721-ICB1	Mercury	0.0465	0.30	0.046	ug/L	J	11/17/06 08:11
6111721-CCB1	Mercury	0.0367	0.30	0.046	ug/L	U	11/17/06 08:25
0613549-BLK1	Mercury, Total	0.050	0.050	0.0077	mg/kg dry wt.	U	11/17/06 08:30
6111721-CCB2	Mercury	0.0205	0.30	0.046	ug/L	U	11/17/06 09:39
6111721-CCB3	Mercury	0.0352	0.30	0.046	ug/L	U	11/17/06 10:40
0613550-BLK1	Mercury, Total	0.050	0.050	0.0077	mg/kg dry wt.	U	11/17/06 10:59
6111721-CCB4	Mercury	0.0380	0.30	0.046	ug/L	U	11/17/06 12:07
6111721-CCB5	Mercury	0.0424	0.30	0.046	ug/L	U	11/17/06 13:06
6111721-CCB6	Mercury	0.0357	0.30	0.046	ug/L	U	11/17/06 14:23

* Values outside of QC limits

01347

SDG CASE NARRATIVE

URS Group, Inc.
Radford Army Ammunition Plant
SWMU 54

SDG – 36440-29
JANUARY 9, 2007

This case narrative is applicable to samples collected from SWMU54 at Radford Army Ammunition Plant (the Site), Radford, Virginia by URS Group, Inc. (the Client) and received by TriMatrix Laboratories, Inc. (TriMatrix) on November 9, 2006. The samples were assigned to TriMatrix project sample delivery group (SDG) 36440-29 for analytical services (the Project) to be performed according to:

a) Subcontract NCA-06-1783, URS Project No. 11656351.30013,

b) the Scope of Work (SOW) for the above,

c) Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006 (by reference)

d) any verbal and written correspondence between the Client and TriMatrix as the Project progressed.

No part of this Project was subcontracted.

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Individual sample results relate only to the sample tested.

Sample Receipt and Log-in

On November 19, 2006 at 09:00 hrs, two sample coolers containing multiple soil samples were received at TriMatrix via FedEx (the carrier). The coolers had been shipped from the Site on November 8.

The external custody seal affixed to each cooler was intact. The samples were received on ice and in good condition. The receipt temperature of the interior of each cooler was measured via a 'temperature blank' shipped in it; the measured temperatures, in °C, were 1.9 and 1.4.

Shipping documents included two field chains-of-custody forms (COC) and associated carrier air bills.

Samples 'NR-SED-14' and 'NR-SED-5' were designated by the Client for MS/MSD analysis for all target parameters.

Samples were assigned to Work Order 0611283and SDG 36440-29.

Copies of all referenced receipt and custody documents are provided in Section A of this data package. Correspondence regarding completed sample log-in activities will be found in Attachment 1 of this narrative.

Provision of Sample Receipt Information to Client

A copy of the COCs and receipt checklist were transmitted to the Client within one day of sample receipt. The Client did not request any modification(s) to the analyses, as listed on the COC.

Post-Receipt Sample Custody

Custody of the sample during sample preparation (if applicable) and analysis was assigned to individual analysts. Copies of completed 'internal chain of custody' forms are included in Section A.

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Variances

Data Qualifier Flags

Data qualifier flags other than those listed in the DoD QSM were employed or the definition of an existing flag was modified.

J – Estimated: the analyte was detected at a concentration greater than the limit of detection (i.e., MDL) but less than the reporting limit (i.e., MRL).

B – Blank contamination: The analyte was detected above one-half the reporting limit in an associated method blank. The same analyte in the sample was detected at less than five times the method blank concentration. (If a common laboratory contaminant is present in the method blank at a concentration greater than one-half the reporting limit but less than or equal to that reporting limit, any associated sample results are flagged but corrective action is not necessarily taken. A text qualifier is also associated with such a result.)

E – Exceeds calibration range: The analyte response exceeded the calibrated range of the instrument. (With the exception of metals for which only the final non-qualified result is reported, both the initial E-qualified result and final non-qualified result from reanalysis-at-dilution are reported.)

Text Qualifier

A LIMS-generated text qualifier is substituted for many instances in which the DoD QSM "Q" flag would otherwise apply. The text qualifiers are listed in a summary format by parameter with applicable samples identified.

Methods 6010 and 6020A

The acceptance criterion of < 2 x RL was substituted for < 2 x MDL for interference check solution ICS-A.

Analytical Methods

Sample preparation and analytical methods that were employed are per the SOW.

Method Detection Limits, Target Analytes, and Reporting Limits

All method detection limits (MDL) for analytes in this report are compliant with the DoD QSM specification that each reporting limit (RL) employed is to be at least three times the MDL. In addition, no RL is less than the equivalent concentration of the lowest instrument calibration standard. The target analyte list was specified by the Client. Proposed RLs were submitted by TriMatrix to the Client prior to the receipt of any samples.

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Project-specific Analytes of Concern

No project-specific analytes of concern were identified in the SOW.

Quality Control Limits

Quality control limits specified in the DoD QSM were employed. Although Method 6010B LCS recovery limits are specified in the QSM, limits for Method 6020A are not. However, Method 6010B limits from the QSM were employed for Method 6020A.

Hold Times

All samples were extracted/digested (where applicable) and analyzed within hold time.

Technical Issues

There were no technical issues.

Sample Result Reporting Convention

Sample results are reported as RL 'U' (e.g., 0.001 U) if the target analyte was not detected above the MDL. If a sample for an organic parameter is reanalyzed and also reported, the second analysis includes the suffix 'REn' where n = the first, second, etc. reanalysis. If a sample for an organic parameter is reanalyzed for confirmation purposes and also reported, the second analysis includes the suffix 'RE1'.

Data Qualifier Designation

If applicable, a sample result is qualified with:

- a "U" flag if the analyte was not detected at a concentration greater than the MDL,
- a "B", "J", and/or an "E" flag as defined in the preceding Variance section,
- a LIMS-generated statement of qualification. Qualifying statements, if any, will be found in Attachment 2 to this narrative.

QC Batch and Analytical Batch Designation

A QC Batch is a seven digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation); it is limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.).

An Analytical Batch (or Sequence) is a seven digit number that associates all samples analyzed as a set under one analytical sequence.

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Individual sample results relate only to the sample tested.

STATEMENT OF DATA QUALIFICATIONS

Total Metals by EPA 6000/7000 Series Methods

Qualification: The analyte concentration in the associated MB was greater than or equal to 1/2 the RL. The positive sample result, which was greater than 5 times the MB value, is not considered estimated.

Analysis:	USEPA-6010B	
Sample/Analyte:	0611283-01 NR-SED-22	Chromium
	0611283-01 NR-SED-22	Iron
	0611283-02 NR-SED-23	Chromium
	0611283-02 NR-SED-23	Iron
	0611283-03 NR-SED-21	Iron
	0611283-04 NR-SED-20	Iron
	0611283-05 NR-SED-19	Iron
	0611283-06 NR-SED-18	Chromium
	0611283-06 NR-SED-18	Iron
	0611283-07 NR-SED-17	Iron
	0611283-08 NR-SED-16	Iron
	0611283-09 NR-SED-15	Iron
	0611283-10 DUP-1	Iron
	0611283-11 NR-SED-14	Iron
	0611283-12 NR-SED-13	Iron
	0611283-13 NR-SED-12	Iron
	0611283-14 NR-SED-11	Iron
	0611283-15 NR-SED-10	Chromium
	0611283-15 NR-SED-10	Iron
	0611283-16 NR-SED-9	Iron
	0611283-17 NR-SED-8	Iron
	0611283-18 DUP-2	Iron
	0611283-19 NR-SED-6	Chromium
	0611283-19 NR-SED-6	Iron
	0611283-23 NR-SED-1	Chromium
	0611283-24 NR-SED-4	Chromium
	0611283-25 NR-SED-7	Chromium
	0611283-26 DUP-3	Chromium
Analysis:	USEPA-6020A	
Sample/Analyte:	0611283-01 NR-SED-22	Lead
	0611283-02 NR-SED-23	Lead
	0611283-03 NR-SED-21	Lead
	0611283-04 NR-SED-20	Lead
	0611283-05 NR-SED-19	Lead
	0611283-06 NR-SED-18	Lead
	0611283-07 NR-SED-17	Lead
	0611283-08 NR-SED-16	Lead
	0611283-09 NR-SED-15	Lead
	0611283-10 DUP-1	Lead
	0611283-11 NR-SED-14	Lead
	0611283-12 NR-SED-13	Lead
	0611283-13 NR-SED-12	Lead
	0611283-14 NR-SED-11	Lead
	0611283-15 NR-SED-10	Lead
	0611283-16 NR-SED-9	Lead

Continued on next page

STATEMENT OF DATA QUALIFICATIONS

Total Metals by EPA 6000/7000 Series Methods (Continued)

Qualification:	The analyte concentration in the associated MB was greater than or equal to 1/2 the RL. The positive sample result, which was greater than 5 times the MB value, is not considered estimated.	
Analysis:	USEPA-6020A	
Sample/Analyte:	0611283-17 NR-SED-8	Lead
	0611283-18 DUP-2	Lead
	0611283-19 NR-SED-6	Lead
	0611283-20 NR-SED-5	Vanadium
	0611283-21 NR-SED-3	Vanadium
	0611283-22 NR-SED-2	Vanadium
	0611283-23 NR-SED-1	Vanadium
	0611283-24 NR-SED-4	Vanadium
	0611283-25 NR-SED-7	Vanadium
	0611283-26 DUP-3	Vanadium
Qualification:	The % difference in results between the sample and a serial dilution of the sample exceeded the control limit. Sample matrix interference is suspected and the reported result is considered estimated.	
Analysis:	USEPA-6010B	
Sample/Analyte:	0611283-11 NR-SED-14	Iron
Analysis:	USEPA-6020A	
Sample/Analyte:	0611283-11 NR-SED-14	Copper
	0611283-11 NR-SED-14	Nickel
	0611283-11 NR-SED-14	Vanadium
	0611283-20 NR-SED-5	Arsenic
Qualification:	This analyte was not present in this sample at a concentration greater than 50 times the MDL, therefore serial dilution is not required.	
Analysis:	USEPA-6010B	
Sample/Analyte:	0611283-11 NR-SED-14	Beryllium
	0611283-11 NR-SED-14	Cobalt
	0611283-20 NR-SED-5	Cobalt
	0611283-20 NR-SED-5	Sodium
Qualification:	This analyte was not present in this sample at a concentration greater than 100 times the MDL, therefore serial dilution is not required.	
Analysis:	USEPA-6020A	
Sample/Analyte:	0611283-20 NR-SED-5	Antimony
	0611283-20 NR-SED-5	Selenium
Qualification:	The MS and/or MSD recovery was outside the control limit. The non-spiked sample result is considered estimated.	
Analysis:	USEPA-6010B	
Sample/Analyte:	0611283-11 NR-SED-14	Calcium
	0611283-11 NR-SED-14	Magnesium
Analysis:	USEPA-6020A	
Sample/Analyte:	0611283-11 NR-SED-14	Arsenic
	0611283-11 NR-SED-14	Selenium
	0611283-20 NR-SED-5	Arsenic

Continued on next page

STATEMENT OF DATA QUALIFICATIONS

Total Metals by EPA 6000/7000 Series Methods (Continued)

Qualification:	The MS and/or MSD recovery was outside the control limit. The non-spiked sample result is considered estimated.	
Analysis:	USEPA-6020A	
Sample/Analyte:	0611283-20 NR-SED-5	Selenium
Qualification:	The RPD between the MS and MSD results exceeded the control limit. The non-spiked sample result is considered estimated.	
Analysis:	USEPA-6010B	
Sample/Analyte:	0611283-11 NR-SED-14	Calcium
	0611283-11 NR-SED-14	Magnesium
Qualification:	The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was greater than or equal to 4 times the spiked amount; the non-spiked sample result is not qualified.	
Analysis:	USEPA-6010B	
Sample/Analyte:	0611283-11 NR-SED-14	Aluminum
	0611283-11 NR-SED-14	Iron
	0611283-11 NR-SED-14	Manganese
	0611283-11 NR-SED-14	Zinc
	0611283-20 NR-SED-5	Aluminum
	0611283-20 NR-SED-5	Barium
	0611283-20 NR-SED-5	Iron
	0611283-20 NR-SED-5	Manganese
Analysis:	USEPA-6020A	
Sample/Analyte:	0611283-11 NR-SED-14	Lead
Qualification:	The MS or MSD recovery, but not both, was outside the control limit. The RPD is within the control limit. The unspiked sample result is not qualified.	
Analysis:	USEPA-6010B	
Sample/Analyte:	0611283-11 NR-SED-14	Barium

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 116523

Page 1 of 2

For Lab Use Only
Cart 9
VOA Rack/Tray
Receipt Log No. 43-15
Project Chemist EQR
Laboratory Project No. E 0011283

Client Name: RFAAP - URS
Address: 5540 Falmouth St Suite 201
Richmond, VA 23230
Phone 804.965.9000
Fax 804.965.9764

Project Name
Client Project No. / P.O. No. 11652351
Invoice To ~~Client~~ ☐ Other (comments)
Contact/Report To Tina DeVine

Analyses Requested (1)
Container Type (corresponds to Container Packing List): A A
Explosives Mg tals
Number of Containers Submitted: 1 6 1 7

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix										Total	Sample Comments
01	SO	01	1	NR-SED-22	TM1430	11/8/06	825		X	SED	1	1								2	
01	SO	02	2	NR-SED-23		11/8/06	905		X	SED	1	1								2	
01	SO	03	3	NR-SED-21		11/8/06	925		X	SED	1	1								2	
01	SO	04	4	NR-SED-20		11/8/06	950		X	SED	1	1								2	
01	SO	05	5	NR-SED-19		11/8/06	1010		X	SED	1	1								2	
01	SO	06	6	NR-SED-18		11/8/06	1020		X	SED	1	1								2	
01	SO	07	7	NR-SED-17		11/8/06	1035		X	SED	1	1								2	
01	SO	08	8	NR-SED-16		11/8/06	1050		X	SED	1	1								2	
01	SO	09	9	NR-SED-15		11/8/06	1100		X	SED	1	1								2	
02	SO	10	10	DUP-1	↓	11/8/06	—		X	SED	1	1								2	

Sampled By (print) DAVID COPEN
Sampler's Signature
Company URS Corp

How Shipped? Hand Carrier Fed Ex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/8/06	1620						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Ziegler	11-9-06	9:00

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TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 116525 (2)

Page 2 of 2

For Lab Use Only
Cart: 9
VOA Rack/Tray:
Receipt Log No.: 43-15
Project Chemist: WDR
Laboratory Project No.: E 0601283

Client Name: RFAAP. URS
Address: 5540 Falmouth St Suite 201
Richmond, VA 23230
Phone: 804.965.9000
Fax: 804.965.9764

Project Name:
Client Project No. / P.O. No.: 116326351
Invoice To: (X) Client ( ) Other (comments)
Contact/Report To: Tina DeVine

Analyses Requested: Metals, Explosives

PRESERVATIVES: A NONE pH~7; B HNO_3 pH<2; C H_2SO_4 pH<2; D 1+1 HCl pH<2; E NaOH pH>12; F ZnAc/NaOH pH>9; G MeOH; H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List) 16	17	Total	Sample Comments
03	So	11	11	NR-SED-14	TM1430	11/8/06	1125		X	SED	1	1	2	
01	So	12	12	NR-SED-13		11/8/06	1150		X	SED	1	1	2	
01	So	13	13	NR-SED-12		11/8/06	1200		X	SED	1	1	2	
	So	14	14	NR-SED-11		11/8/06	1235		X	SED	1	1	2	
~~-~~	~~-~~		15	NR-SED-14 MS		11/8/06	1125		X	SED	1	1	2	MS & MSD for line 11
~~-~~	~~-~~		16	NR-SED-14 MSD		11/8/06	1125		X	SED	1	1	2	
01	So	15	17	NR-SED-10		11/8/06	1250		X	SED	1	1	2	
01	So	16	18	NR-SED-9		11/8/06	1305		X	SED	1	1	2	
01	So	17	19	NR-SED-8		11/8/06	1325		X	SED	1	1	2	
02	So	18	20	DUP-2	↓	11/8/06	—		X	SED	1	1	2	

Sampled By (print): DAVID COPEN
Sampler's Signature: David Copen
Company: URS Corp.

How Shipped? Hand Carrier
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
David Copen	11/8/06	1625						

1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Ziegler	11-9-06	9:00

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TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 116526

Page 3 of 3

For Lab Use Only
Cart 9
VOA Rack/Tray
Receipt Log No. 43-15
Project Chemist
Laboratory Project No. 0011283

Client Name: RFAAP - URS
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone 804.965.9000
Fax 804.965.9764

Project Name
Client Project No. / P.O. No. 11656351
Invoice To ☒ Client ☐ Other (comments)
Contact/Report To Tina DeVine

Analyses Requested

Container Type (corresponds to Container Packing List): A A

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted: Metals	Explosives	Total	Sample Comments
01	So	19	21	NR-SED-6	JM0199	11/8/06	1340		X	SED	1	1	2	
01	So	20	23	NR-SED-5		11/8/06	1350		X	SED	1	1	2	
			23	NR-SED-5 MS		11/8/06	↓		X	SED	1	1	2	MS+MSD for Line 23 LMC
			24	NR-SED-5 MSD		11/8/06	↓		X	SED	1	1	2	
01	So	21	25	NR-SED-3		11/8/06	1405		X	SED	1	1	2	
01	So	22	26	NR-SED-2		11/8/06	1425		X	SED	1	1	2	
01	So	23	27	NR-SED-1		11/8/06	1435		X	SED	1	1	2	
01	So	24	28	NR-SED-4		11/8/06	1450		X	SED	1	1	2	
01	So	25	29	NR-SED-7		11/8/06	1500		X	SED	1	1	2	
02	So	26	30	DUP-3	↓	11/8/06	—		X	SED	1	1	2	

Preservatives: A NONE pH~7; B HNO_3 pH<2; C H_2SO_4 pH<2; D 1+1 HCl pH<2; E NaOH pH>12; F ZnAc/NaOH pH>9; G MeOH; H Other (note below)

Sampled By (print): DAVID COPEN
Sampler's Signature: David Copen
Company: URS Corp

How Shipped? Hand Carrier Fed Ex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
David Copen	11/8/06	1640						

1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Ziegler	11-9-06	9:00

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-32 **Fraction:** Explosives_Pesticides_PCBs & Perchlorate

Lab: TriMatrix **Project Name** Radford SWMU 54

Reviewer: RA **Date:** January 29, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: For the explosives analyses, the matrix spike pair analyzed for sample 54MW2 displayed percent recoveries (%Rs) greater than the upper control limit of 135% for 2,6-dinitrotoluene (335%/331%). The associated parent sample result was non-detect and no data qualifying action was necessary. This matrix spike pair also displayed %Rs less than the lower control limit of 80% for octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (56%/42%). The associated parent sample result was positive and was flagged "J,m". The second matrix spike pair analyzed for sample 54MW2 also displayed %Rs greater than the upper control limits for 2,4-dinitrotoluene (209%/213%), and octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (132%/117%). The results from the second analysis were not reported for this sample, and no data qualifying action was necessary.

For the pesticides analyses, the matrix spike pair analyzed for sample 54MW2 displayed %Rs less than the lower control limits for alpha-BHC, first column (55%/56%) and beta-BHC, second column (48%/21%). The associated parent sample results were non-detects and were flagged "UJ,m". This matrix spike pair also displayed %Rs greater than the upper control limits for beta-BHC first column (276%/251%), gamma-BHC, second column (570%/593%), gamma-chlordane, first column (186%/171%), endosulfan I, first column (607%/613%), and heptachlor, first column (441%/414%). The matrix spike pair also displayed a relative percent difference greater than the upper control limit of 17% for beta-BHC, second column at 79%. The associated parent sample results were non-detects and no data qualifying action was necessary.

SDG CASE NARRATIVE

URS Group, Inc.
Radford Army Ammunition Plant
SWMU 54

SDG – 36440-32
JANUARY 16, 2007

This case narrative is applicable to aqueous samples collected from SWMU54 at Radford Army Ammunition Plant (the Site), Radford, Virginia by URS Group, Inc. (the Client) and received by TriMatrix Laboratories, Inc. (TriMatrix) on November 30 and December 1, 2, and 6, 2006. The samples were assigned to TriMatrix project sample delivery group (SDG) 36440-32 for analytical services (the Project) to be performed according to:

a) Subcontract NCA-06-1783, URS Project No. 11656351.30013,

b) the Scope of Work (SOW) for the above,

c) Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006 (by reference)

d) any verbal and written correspondence between the Client and TriMatrix as the Project progressed.

No part of this Project was subcontracted.

Field Sample and Assigned Laboratory Sample ID Summary

For the samples received, a field sample to laboratory sample ID cross-reference table follows below and on the next page.

Field Sample Name	Sample Matrix	Laboratory Sample ID	Date Sampled	Date Received
54MW6	Water	0612019-01	11/29/06	11/30/06
54MW1	Water	0612019-02	11/29/06	11/30/06
54MW5	Water	0612019-03	11/29/06	11/30/06
EQBK-1	Water	0612019-04	11/29/06	11/30/06

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Individual sample results relate only to the sample tested.

Field Sample and Assigned Laboratory Sample ID Summary – (continued)

Field Sample Name	Sample Matrix	Laboratory Sample ID	Date Sampled	Date Received
54MW2	Water	0612019-05	11/29/06	11/30/06
NR-SW-6	Water	0612020-01	11/30/06	12/01/06
NR-PW-6	Water	0612020-02	11/30/06	12/01/06
54MW4	Water	0612020-03	11/30/06	12/01/06
DUP-3	Water	0612020-04	11/30/06	12/01/06
NR-SW-5	Water	0612020-05	11/30/06	12/01/06
NR-PW-5	Water	0612020-06	11/30/06	12/01/06
NR-SW-4	Water	0612020-07	11/30/06	12/01/06
NR-PW-4	Water	0612020-08	11/30/06	12/01/06
NR-SW-3	Water	0612020-09	11/30/06	12/01/06
NR-PW-3	Water	0612020-10	11/30/06	12/01/06
NR-SW-2	Water	0612020-11	11/30/06	12/01/06
NR-PW-2	Water	0612020-12	11/30/06	12/01/06
NR-PW-1	Water	0612020-13	11/30/06	12/01/06
NR-SW-1	Water	0612020-14	11/30/06	12/01/06
54MW8	Water	0612021-01	12/01/06	12/02/06
54MW10	Water	0612021-02	12/01/06	12/02/06
54MW9	Water	0612021-03	12/01/06	12/02/06
NR-PW-9	Water	0612021-04	12/01/06	12/02/06
NR-SW-10	Water	0612021-05	12/01/06	12/02/06
NR-PW-10	Water	0612021-06	12/01/06	12/02/06
NR-SW-7	Water	0612021-07	12/01/06	12/02/06
NR-PW-7	Water	0612021-08	12/01/06	12/02/06
NR-SW-8	Water	0612021-09	12/01/06	12/02/06
NR-PW-8	Water	0612021-10	12/01/06	12/02/06
NR-SW-9	Water	0612021-11	12/01/06	12/02/06
DUP-4	Water	0612021-12	12/01/06	12/02/06
54MW7	Water	0612079-01	12/05/06	12/06/06
54MW3	Water	0612079-02	12/05/06	12/06/06
DUP-5	Water	0612079-03	12/05/06	12/06/06

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Individual sample results relate only to the sample tested.

SAMPLE ID SUMMARY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-32
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS

Client Sample Id:	Lab Sample Id:
54MW6	0612019-01
54MW1	0612019-02
54MW5	0612019-03
54MW5	0612019-03RE1
EQBK-1	0612019-04
54MW2	0612019-05
54MW2	0612019-05RE1
NR-SW-6	0612020-01
NR-PW-6	0612020-02
54MW4	0612020-03
DUP-3	0612020-04
NR-SW-5	0612020-05
NR-PW-5	0612020-06
NR-PW-5	0612020-06RE1
NR-SW-4	0612020-07
NR-PW-4	0612020-08
NR-SW-3	0612020-09
NR-PW-3	0612020-10
NR-SW-2	0612020-11
NR-PW-2	0612020-12
NR-PW-1	0612020-13
NR-SW-1	0612020-14
54MW8	0612021-01
54MW8	0612021-01RE1
54MW10	0612021-02
54MW10	0612021-02RE1
54MW9	0612021-03
54MW9	0612021-03RE1
NR-PW-9	0612021-04
NR-SW-10	0612021-05
NR-PW-10	0612021-06
NR-SW-7	0612021-07
NR-PW-7	0612021-08
NR-SW-8	0612021-09
NR-PW-8	0612021-10
NR-SW-9	0612021-11
DUP-4	0612021-12
54MW7	0612079-01
54MW7	0612079-01RE1
54MW3	0612079-02
54MW3	0612079-02RE1

DUP-5 ✓	0612079-03
DUP-5	0612079-03RE1

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-01 File ID: data006-0

Sampled: 11/29/06 11:00 Prepared: 12/04/06 10:05 Analyzed: 12/05/06 16:49

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.23	65	30 - 138	

* Values outside of QC limits

00125

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-02 File ID: data007-0

Sampled: 11/29/06 13:55 Prepared: 12/04/06 10:05 Analyzed: 12/05/06 17:30

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.23	65	30 - 138	

* Values outside of QC limits

00128

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-03 File ID: data008-0

Sampled: 11/29/06 17:05 Prepared: 12/04/06 10:05 Analyzed: 12/05/06 18:12

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	0.29	5.0	0.075	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.92	5.0	0.20	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	1.1	5.0	0.31	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	0.38	5.0	0.18	J
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	4.2	5.0	0.25	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.61	71	30 - 138	

* Values outside of QC limits

00131

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Water Laboratory ID: 0612019-04 File ID: data009-0

Sampled: 11/29/06 17:15 Prepared: 12/04/06 10:05 Analyzed: 12/05/06 18:54

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.63	71	30 - 138	

* Values outside of QC limits

00134

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-05 File ID: data010-0

Sampled: 11/29/06 15:05 Prepared: 12/04/06 10:05 Analyzed: 12/05/06 19:36

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.63	5.0	0.16	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.6	5.0	0.075	
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	3.6	5.0	0.20	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	3.1	5.0	0.31	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	9.3	5.0	0.25	

JJ

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.10	63	30 - 138	

* Values outside of QC limits

00137

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SW-6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Surface Water Laboratory ID: 0612020-01 File ID: data011-0

Sampled: 11/30/06 13:30 Prepared: 12/04/06 10:05 Analyzed: 12/05/06 20:18

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.80	58	30 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-PW-6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612020-02 File ID: data012-0

Sampled: 11/30/06 13:40 Prepared: 12/04/06 10:05 Analyzed: 12/05/06 20:59

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.88	60	30 - 138	

* Values outside of QC limits

00143

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612020-03 File ID: data014-0

Sampled: 11/30/06 16:00 Prepared: 12/04/06 10:05 Analyzed: 12/05/06 22:23

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.35	67	30 - 138	

* Values outside of QC limits

00146

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612020-04 File ID: data015-0

Sampled: 11/30/06 00:00 Prepared: 12/04/06 10:05 Analyzed: 12/05/06 23:05

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.60	71	30 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SW-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Surface Water Laboratory ID: 0612020-05 File ID: data005-0

Sampled: 11/30/06 12:40 Prepared: 12/05/06 11:28 Analyzed: 12/06/06 16:05

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121253 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.70	57	30 - 138	

* Values outside of QC limits

00152

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-PW-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612020-06 File ID: data006-0

Sampled: 11/30/06 13:05 Prepared: 12/05/06 11:28 Analyzed: 12/06/06 16:46

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121253 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	1.7	5.0	0.25	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.66	56	30 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SW-4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Surface Water Laboratory ID: 0612020-07 File ID: data007-0

Sampled: 11/30/06 12:10 Prepared: 12/05/06 11:28 Analyzed: 12/06/06 17:28

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121253 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.85	59	30 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-PW-4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612020-08 File ID: data008-0

Sampled: 11/30/06 12:20 Prepared: 12/05/06 11:28 Analyzed: 12/06/06 18:10

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121253 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	2.73	42	30 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SW-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Surface Water Laboratory ID: 0612020-09 File ID: data016-0

Sampled: 11/30/06 11:25 Prepared: 12/04/06 10:05 Analyzed: 12/05/06 23:47

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.65	56	30 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-PW-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612020-10 File ID: data017-0

Sampled: 11/30/06 11:55 Prepared: 12/04/06 10:05 Analyzed: 12/06/06 00:28

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.09	63	30 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SW-2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Surface Water Laboratory ID: 0612020-11 File ID: data018-0

Sampled: 11/30/06 10:30 Prepared: 12/04/06 10:05 Analyzed: 12/06/06 01:10

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.75	58	30 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-PW-2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612020-12 File ID: data019-0

Sampled: 11/30/06 11:10 Prepared: 12/04/06 10:05 Analyzed: 12/06/06 01:52

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.19	64	30 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-PW-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612020-13 File ID: data020-0

Sampled: 11/30/06 09:10 Prepared: 12/04/06 10:05 Analyzed: 12/06/06 02:34

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.43	68	30 - 138	

* Values outside of QC limits

AR178

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SW-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Surface Water Laboratory ID: 0612020-14 File ID: data021-0

Sampled: 11/30/06 09:15 Prepared: 12/04/06 10:05 Analyzed: 12/06/06 03:16

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.87	60	30 - 138	

* Values outside of QC limits

00179

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW8

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-01 File ID: data022-0

Sampled: 12/01/06 14:40 Prepared: 12/04/06 10:05 Analyzed: 12/06/06 03:57

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.42	5.0	0.31	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.9	5.0	0.25	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.23	65	30 - 138	

* Values outside of QC limits

00182

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW10

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-02 File ID: data023-0

Sampled: 12/01/06 15:50 Prepared: 12/04/06 10:05 Analyzed: 12/06/06 04:39

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.84	5.0	0.16	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	2.1	5.0	0.075	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.1	5.0	0.20	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.0	5.0	0.31	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	3.3	5.0	0.16	J
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	1.6	5.0	0.25	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.00	62	30 - 138	

* Values outside of QC limits

00185

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW9

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-03 File ID: data025-0

Sampled: 12/01/06 13:20 Prepared: 12/04/06 10:05 Analyzed: 12/06/06 06:03

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.36	5.0	0.31	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.0	5.0	0.25	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.30	66	30 - 138	

* Values outside of QC limits

00188

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-PW-9

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-04 File ID: data026-0

Sampled: 12/01/06 09:35 Prepared: 12/04/06 10:05 Analyzed: 12/06/06 06:45

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614210 Sequence: 6120619 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.60	71	30 - 138	

* Values outside of QC limits

00191

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SW-10

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Surface Water Laboratory ID: 0612021-05 File ID: data009-0

Sampled: 12/01/06 10:00 Prepared: 12/05/06 11:28 Analyzed: 12/06/06 18:52

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121253 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.06	63	30 - 138	

* Values outside of QC limits

00194

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-PW-10

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-06 File ID: data010-0

Sampled: 12/01/06 10:15 Prepared: 12/05/06 11:28 Analyzed: 12/06/06 19:34

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121253 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.62	56	30 - 138	

* Values outside of QC limits

00197

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SW-7

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Surface Water Laboratory ID: 0612021-07 File ID: data011-0

Sampled: 12/01/06 07:50 Prepared: 12/05/06 11:28 Analyzed: 12/06/06 20:15

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121253 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.98	61	30 - 138	

* Values outside of QC limits

00200

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-PW-7

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-08 File ID: data012-0

Sampled: 12/01/06 08:15 Prepared: 12/05/06 11:28 Analyzed: 12/06/06 20:57

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121253 Calibration: 6K21021 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.91	60	30 - 138	

* Values outside of QC limits

00203

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SW-8

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Surface Water Laboratory ID: 0612021-09 File ID: EXa016-0

Sampled: 12/01/06 08:35 Prepared: 12/05/06 11:28 Analyzed: 12/13/06 02:05

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121428 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.73	73	30 - 138	

* Values outside of QC limits

00206

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-PW-8

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-10 File ID: EXa017-0

Sampled: 12/01/06 09:00 Prepared: 12/05/06 11:28 Analyzed: 12/13/06 02:47

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121428 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.47	69	30 - 138	

* Values outside of QC limits

00209

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

NR-SW-9

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Surface Water Laboratory ID: 0612021-11 File ID: EXa018-0

Sampled: 12/01/06 09:20 Prepared: 12/05/06 11:28 Analyzed: 12/13/06 03:29

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121428 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.79	74	30 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Water Laboratory ID: 0612021-12 File ID: EXa019-0

Sampled: 12/01/06 00:00 Prepared: 12/05/06 11:28 Analyzed: 12/13/06 04:11

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121428 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.61	71	30 - 138	

* Values outside of QC limits

00215

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW7

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612079-01 File ID: EXa022-0

Sampled: 12/05/06 11:50 Prepared: 12/07/06 11:28 Analyzed: 12/13/06 06:16

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121428 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	0.66	5.0	0.25	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.60	71	30 - 138	

* Values outside of QC limits

00218

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612079-02 File ID: EXa023-0

Sampled: 12/05/06 12:40 Prepared: 12/07/06 11:28 Analyzed: 12/13/06 06:58

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121428 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.26	5.0	0.16	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	0.85	5.0	0.075	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.80	5.0	0.20	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	1.0	5.0	0.31	J
99-99-0	4-Nitrotoluene	1	0.69	5.0	0.15	J
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	3.6	5.0	0.25	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.60	71	30 - 138	

* Values outside of QC limits

00221

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612079-03 File ID: EXa025-0

Sampled: 12/05/06 00:00 Prepared: 12/07/06 11:28 Analyzed: 12/13/06 08:22

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0614214 Sequence: 6121428 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	0.78	5.0	0.075	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.77	5.0	0.20	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.91	5.0	0.31	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	3.4	5.0	0.25	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.53	70	30 - 138	

* Values outside of QC limits

00224

SAMPLE ID SUMMARY

USEPA-8082

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-32
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS

Client Sample Id:	Lab Sample Id:
54MW6	0612019-01
54MW1	0612019-02
54MW5	0612019-03
EQBK-1	0612019-04
54MW2	0612019-05
54MW4	0612020-03
54MW8	0612021-01
54MW10	0612021-02
54MW9	0612021-03
54MW7	0612079-01
54MW3	0612079-02
DUP-5	0612079-03

01077

ANALYSIS DATA SHEET

54MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-01 File ID: A174758-0

Sampled: 11/29/06 11:00 Prepared: 12/05/06 08:04 Analyzed: 12/06/06 10:50

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1050 mL / 2 mL

QC Batch: 0614202 Sequence: 6120627 Calibration: 6L05003 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.190	0.160	84	40 - 135	
Tetrachloro-m-xylene		0.190	0.152	80	36 - 114	

* Values outside of QC limits

01100

ANALYSIS DATA SHEET

54MW1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-02 File ID: A174759-0

Sampled: 11/29/06 13:55 Prepared: 12/05/06 08:04 Analyzed: 12/06/06 11:08

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1060 mL / 2 mL

QC Batch: 0614202 Sequence: 6120627 Calibration: 6L05003 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.189	0.183	97	40 - 135	
Tetrachloro-m-xylene		0.189	0.170	90	36 - 114	

* Values outside of QC limits

01105

ANALYSIS DATA SHEET

54MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-03 File ID: A174760-0

Sampled: 11/29/06 17:05 Prepared: 12/05/06 08:04 Analyzed: 12/06/06 11:26

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1060 mL / 2 mL

QC Batch: 0614202 Sequence: 6120627 Calibration: 6L05003 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.189	0.158	84	40 - 135	
Tetrachloro-m-xylene		0.189	0.169	90	36 - 114	

* Values outside of QC limits

01118

ANALYSIS DATA SHEET

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Water Laboratory ID: 0612019-04 File ID: A174761-0

Sampled: 11/29/06 17:15 Prepared: 12/05/06 08:04 Analyzed: 12/06/06 11:43

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0614202 Sequence: 6120627 Calibration: 6L05003 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Decachlorobiphenyl	0.189	0.108	57	40 - 135	
Tetrachloro-m-xylene	0.189	0.162	86	36 - 114	

* Values outside of QC limits

01127

ANALYSIS DATA SHEET

54MW2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-05 File ID: A174763-0

Sampled: 11/29/06 15:05 Prepared: 12/05/06 08:04 Analyzed: 12/06/06 12:19

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0614202 Sequence: 6120627 Calibration: 6L05003 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.189	0.183	97	40 - 135	
Tetrachloro-m-xylene		0.189	0.170	90	36 - 114	

* Values outside of QC limits

01136

ANALYSIS DATA SHEET

54MW4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612020-03 File ID: A174764-0

Sampled: 11/30/06 16:00 Prepared: 12/05/06 08:04 Analyzed: 12/06/06 12:37

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1050 mL / 2 mL

QC Batch: 0614202 Sequence: 6120627 Calibration: 6L05003 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.190	0.175	92	40 - 135	
Tetrachloro-m-xylene		0.190	0.161	85	36 - 114	

* Values outside of QC limits

01145

ANALYSIS DATA SHEET

54MW8

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-01 File ID: A174765-0

Sampled: 12/01/06 14:40 Prepared: 12/05/06 08:04 Analyzed: 12/06/06 12:55

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1060 mL / 2 mL

QC Batch: 0614202 Sequence: 6120627 Calibration: 6L05003 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.189	0.165	88	40 - 135	
Tetrachloro-m-xylene		0.189	0.161	86	36 - 114	

* Values outside of QC limits

01154

ANALYSIS DATA SHEET

54MW10

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-02 File ID: A174766-0

Sampled: 12/01/06 15:50 Prepared: 12/05/06 08:04 Analyzed: 12/06/06 13:13

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0614202 Sequence: 6120627 Calibration: 6L05003 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.189	0.157	83	40 - 135	
Tetrachloro-m-xylene		0.189	0.153	81	36 - 114	

* Values outside of QC limits

01163

ANALYSIS DATA SHEET

54MW9

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-03 File ID: A174767-0

Sampled: 12/01/06 13:20 Prepared: 12/05/06 08:04 Analyzed: 12/06/06 13:30

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1050 mL / 2 mL

QC Batch: 0614202 Sequence: 6120627 Calibration: 6L05003 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.190	0.153	80	40 - 135	
Tetrachloro-m-xylene		0.190	0.163	85	36 - 114	

* Values outside of QC limits

01172

ANALYSIS DATA SHEET

54MW7

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612079-01 File ID: A175213-0

Sampled: 12/05/06 11:50 Prepared: 12/07/06 08:04 Analyzed: 12/26/06 11:49

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0614202 Sequence: 6122618 Calibration: 6L26004 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Decachlorobiphenyl	0.189	0.163	87	40 - 135	
Tetrachloro-m-xylene	0.189	0.152	81	36 - 114	

* Values outside of QC limits

01181

ANALYSIS DATA SHEET

54MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612079-02 File ID: A175214-0

Sampled: 12/05/06 12:40 Prepared: 12/07/06 08:04 Analyzed: 12/26/06 12:07

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0614202 Sequence: 6122618 Calibration: 6L26004 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.189	0.178	94	40 - 135	
Tetrachloro-m-xylene		0.189	0.156	83	36 - 114	

* Values outside of QC limits

01196

ANALYSIS DATA SHEET

DUP-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612079-03 File ID: A175215-0

Sampled: 12/05/06 00:00 Prepared: 12/07/06 08:04 Analyzed: 12/26/06 12:24

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1040 mL / 2 mL

QC Batch: 0614202 Sequence: 6122618 Calibration: 6L26004 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.192	0.181	94	40 - 135	
Tetrachloro-m-xylene		0.192	0.159	83	36 - 114	

* Values outside of QC limits

01199

ANALYSIS DATA SHEET

54MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-01 File ID: A46_173-0

Sampled: 11/29/06 11:00 Prepared: 12/05/06 08:03 Analyzed: 12/07/06 08:20

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0614201 Sequence: 6120718 Calibration: 6L07005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.150	80	25 - 140	
Decachlorobiphenyl	0.189	0.148	79	30 - 135	

* Values outside of QC limits

00666

ANALYSIS DATA SHEET

54MW1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-02 File ID: A46_174-0

Sampled: 11/29/06 13:55 Prepared: 12/05/06 08:03 Analyzed: 12/07/06 08:59

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1060 mL / 2 mL

QC Batch: 0614201 Sequence: 6120718 Calibration: 6L07005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.173	92	25 - 140	
Decachlorobiphenyl	0.189	0.166	88	30 - 135	

* Values outside of QC limits

00675

ANALYSIS DATA SHEET

54MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-03 File ID: A46_175-0

Sampled: 11/29/06 17:05 Prepared: 12/05/06 08:03 Analyzed: 12/07/06 09:38

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0614201 Sequence: 6120718 Calibration: 6L07005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.168	89	25 - 140	
Decachlorobiphenyl	0.189	0.137	73	30 - 135	

* Values outside of QC limits

0684

ANALYSIS DATA SHEET

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Water Laboratory ID: 0612019-04 File ID: A46_176-0

Sampled: 11/29/06 17:15 Prepared: 12/05/06 08:03 Analyzed: 12/07/06 10:18

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0614201 Sequence: 6120718 Calibration: 6L07005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.156	83	25 - 140	
Decachlorobiphenyl	0.189	0.0923	49	30 - 135	

* Values outside of QC limits

00693

ANALYSIS DATA SHEET

54MW2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612019-05 File ID: A46_177-0

Sampled: 11/29/06 15:05 Prepared: 12/05/06 08:03 Analyzed: 12/07/06 10:57

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1060 mL / 2 mL

QC Batch: 0614201 Val Flag Sequence: 6120718 Calibration: 6L07005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC VJ1M	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC VJ1M	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.174	92	25 - 140	
Decachlorobiphenyl	0.189	0.152	80	30 - 135	

* Values outside of QC limits

00702

ANALYSIS DATA SHEET

54MW4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612020-03 File ID: A46_163-0

Sampled: 11/30/06 16:00 Prepared: 12/05/06 08:01 Analyzed: 12/07/06 01:47

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1050 mL / 2 mL

QC Batch: 0614200 Sequence: 6120718 Calibration: 6L07005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.190	0.162	85	25 - 140	
Decachlorobiphenyl	0.190	0.157	83	30 - 135	

* Values outside of QC limits

00711

ANALYSIS DATA SHEET

54MW8

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-01 File ID: A46_164-0

Sampled: 12/01/06 14:40 Prepared: 12/05/06 08:01 Analyzed: 12/07/06 02:26

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0614200 Sequence: 6120718 Calibration: 6L07005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.159	85	25 - 140	
Decachlorobiphenyl	0.189	0.142	75	30 - 135	

* Values outside of QC limits

00720

ANALYSIS DATA SHEET

54MW10

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-02 File ID: A46_165-0

Sampled: 12/01/06 15:50 Prepared: 12/05/06 08:01 Analyzed: 12/07/06 03:06

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1060 mL / 2 mL

QC Batch: 0614200 Sequence: 6120718 Calibration: 6L07005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.146	78	25 - 140	
Decachlorobiphenyl	0.189	0.129	69	30 - 135	

* Values outside of QC limits

00729

ANALYSIS DATA SHEET

54MW9

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612021-03 File ID: A46_166-0

Sampled: 12/01/06 13:20 Prepared: 12/05/06 08:01 Analyzed: 12/07/06 03:45

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1050 mL / 2 mL

QC Batch: 0614200 Sequence: 6120718 Calibration: 6L07005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.190	0.171	90	25 - 140	
Decachlorobiphenyl	0.190	0.141	74	30 - 135	

* Values outside of QC limits

00737

ANALYSIS DATA SHEET

54MW7

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612079-01 File ID: A46_252-0

Sampled: 12/05/06 11:50 Prepared: 12/07/06 08:03 Analyzed: 12/13/06 09:01

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1060 mL / 2 mL

QC Batch: 0614201 Sequence: 6121511 Calibration: 6L15005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.151	80	25 - 140	
Decachlorobiphenyl	0.189	0.153	81	30 - 135	

* Values outside of QC limits

00746

ANALYSIS DATA SHEET

54MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612079-02 File ID: A46_251-0

Sampled: 12/05/06 12:40 Prepared: 12/07/06 08:03 Analyzed: 12/13/06 08:22

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1060 mL / 2 mL

QC Batch: 0614201 Sequence: 6121511 Calibration: 6L15005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.189	0.153	81	25 - 140	
Decachlorobiphenyl	0.189	0.173	92	30 - 135	

* Values outside of QC limits

00755

ANALYSIS DATA SHEET

DUP-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-32

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Ground Water Laboratory ID: 0612079-03 File ID: A46_250-0

Sampled: 12/05/06 00:00 Prepared: 12/07/06 08:03 Analyzed: 12/13/06 07:42

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1040 mL / 2 mL

QC Batch: 0614201 Sequence: 6121511 Calibration: 6L15005 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.192	0.151	78	25 - 140	
Decachlorobiphenyl	0.192	0.175	91	30 - 135	

* Values outside of QC limits

00764

SAMPLE ID SUMMARY

USEPA-314.0

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-32

Client: URS Group, Inc.

Project: RFAAP SWMU 54 RFI/CMS

Client Sample Id:	Lab Sample Id:
54MW6	0612019-01
54MW1	0612019-02
54MW5	0612019-03
EQBK-1	0612019-04
54MW2	0612019-05
NR-SW-6	0612020-01
NR-PW-6	0612020-02
54MW4	0612020-03
DUP-3	0612020-04
NR-SW-5	0612020-05
NR-PW-5	0612020-06
NR-SW-4	0612020-07
NR-PW-4	0612020-08
NR-SW-3	0612020-09
NR-PW-3	0612020-10
NR-SW-2	0612020-11
NR-PW-2	0612020-12
NR-PW-1	0612020-13
NR-SW-1	0612020-14
54MW8	0612021-01
54MW10	0612021-02
54MW9	0612021-03
NR-PW-9	0612021-04
NR-SW-10	0612021-05
NR-PW-10	0612021-06
NR-SW-7	0612021-07
NR-PW-7	0612021-08
NR-SW-8	0612021-09
NR-PW-8	0612021-10
NR-SW-9	0612021-11
DUP-4	0612021-12
54MW7	0612079-01
54MW3	0612079-02
DUP-5	0612079-03

00498

INORGANIC ANALYSIS DATA SHEET
USEPA-314.0

54MW6

REVISED
CAN 12-4-07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/29/06 11:00
Solids: 0.00
Laboratory ID: 0612019-01

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/18/06 20:15

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

54MW1

REVISED CVA 12/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/29/06 13:55
Solids: 0.00
Laboratory ID: 0612019-02

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/18/06 20:40

INORGANIC ANALYSIS DATA SHEET
USEPA-314.0

54MW5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/29/06 17:05
Solids: 0.00
Laboratory ID: 0612019-03

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CM
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

REVISED
KVH 1/29/07

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/18/06 21:04

INORGANIC ANALYSIS DATA SHEET
USEPA-314.0

EQBK-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Water
Sampled: 11/29/06 17:15
Solids: 0.00
Laboratory ID: 0612019-04

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

REVISED KVH 4/24/07

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/18/06 21:29

00503

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

54MW2

REVISED
KWH 1/29/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/29/06 15:05
Solids: 0.00
Laboratory ID: 0612019-05

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/18/06 21:53

INORGANIC ANALYSIS DATA SHEET
USEPA-314.0

NR-SW-6

REVISED 10TH 9/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Surface Water
Sampled: 11/30/06 13:30
Solids: 0.00
Laboratory ID: 0612020-01

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/18/06 23:06

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-PW-6

REVISED
CM 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/30/06 13:40
Solids: 0.00
Laboratory ID: 0612020-02

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/18/06 23:31

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

54MW4

REVISED
CLH 12/4/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/30/06 16:00
Solids: 0.00
Laboratory ID: 0612020-03

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/18/06 23:55

00507

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

DUP-3

REVISED KH 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/30/06 00:00
Solids: 0.00
Laboratory ID: 0612020-04

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 01:08

00508

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-SW-5

REVISED KVH 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Surface Water
Sampled: 11/30/06 12:40
Solids: 0.00
Laboratory ID: 0612020-05

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 08:52

00509

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-PW-5

REVISED
CMN 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/30/06 13:05
Solids: 0.00
Laboratory ID: 0612020-06

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 01:33

00510

INORGANIC ANALYSIS DATA SHEET
USEPA-314.0

NR-SW-4

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Surface Water
Sampled: 11/30/06 12:10
Solids: 0.00
Laboratory ID: 0612020-07

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

REVISED
ICN 1/29/07

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 01:57

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-PW-4

REVISED
KW 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/30/06 12:20
Solids: 0.00
Laboratory ID: 0612020-08

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 02:21

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-SW-3

REVISED
PCM 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Surface Water
Sampled: 11/30/06 11:25
Solids: 0.00
Laboratory ID: 0612020-09

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 02:46

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-PW-3

REVISED
KVH 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/30/06 11:55
Solids: 0.00
Laboratory ID: 0612020-10

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 03:10

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-SW-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Surface Water
Sampled: 11/30/06 10:30
Solids: 0.00
Laboratory ID: 0612020-11

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

REVISED
KMA 1/24/07

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 03:35

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-PW-2

REVISED
KM 1/29/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/30/06 11:10
Solids: 0.00
Laboratory ID: 0612020-12

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 03:59

INORGANIC ANALYSIS DATA SHEET
USEPA-314.0

NR-PW-1

REVISED
JAN 24 07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 11/30/06 09:10
Solids: 0.00
Laboratory ID: 0612020-13

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 04:23

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-SW-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Surface Water
Sampled: 11/30/06 09:15
Solids: 0.00
Laboratory ID: 0612020-14

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614868

REVISED
JAN 24 07

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 04:48

00518

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

54MW8

REVISED 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 12/01/06 14:40
Solids: 0.00
Laboratory ID: 0612021-01

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 07:39

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

54MW10

REVISED
ICM 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 12/01/06 15:50
Solids: 0.00
Laboratory ID: 0612021-02

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 08:03

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

54MW9

REVISED
JAN 24 07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 12/01/06 13:20
Solids: 0.00
Laboratory ID: 0612021-03

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 08:28

00521

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-PW-9

REVISED
(CM 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 12/01/06 09:35
Solids: 0.00
Laboratory ID: 0612021-04

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 10:05

00522

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-SW-10

REVISED
DW 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Surface Water
Sampled: 12/01/06 10:00
Solids: 0.00
Laboratory ID: 0612021-05

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 10:30

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-PW-10

REVISED
KMH 1/29/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 12/01/06 10:15
Solids: 0.00
Laboratory ID: 0612021-06

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 10:54

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-SW-7

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Surface Water
Sampled: 12/01/06 07:50
Solids: 0.00
Laboratory ID: 0612021-07

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

REVISED
1/24/07

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 11:18

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-PW-7

REVISED (CNH 12/4/07)

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 12/01/06 08:15
Solids: 0.00
Laboratory ID: 0612021-08

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 12:32

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

NR-SW-8

REVISED
CW 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Surface Water
Sampled: 12/01/06 08:35
Solids: 0.00
Laboratory ID: 0612021-09

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 12:56

INORGANIC ANALYSIS DATA SHEET
USEPA-314.0

NR-PW-8

REVISED
CVA 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 12/01/06 09:00
Solids: 0.00
Laboratory ID: 0612021-10

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 13:20

INORGANIC ANALYSIS DATA SHEET
USEPA-314.0

NR-SW-9

REVISED
VCW 2/9/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Surface Water
Sampled: 12/01/06 09:20
Solids: 0.00
Laboratory ID: 0612021-11

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 13:45

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

DUP-4

REVISED 1 OA 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Water
Sampled: 12/01/06 00:00
Solids: 0.00
Laboratory ID: 0612021-12

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 14:09

00530

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

54MW7

REVISED
ICM 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 12/05/06 11:50
Solids: 0.00
Laboratory ID: 0612079-01

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 14:34

INORGANIC ANALYSIS DATA SHEET
USEPA-314.0

54MW3

REVISED
DW 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 12/05/06 12:40
Solids: 0.00
Laboratory ID: 0612079-02

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 14:58

00532

INORGANIC ANALYSIS DATA SHEET

USEPA-314.0

DUP-5

REVISED
KMK 1/24/07

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Ground Water
Sampled: 12/05/06 00:00
Solids: 0.00
Laboratory ID: 0612079-03

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 12/18/06 15:00
Initial/Final: 50 mL / 50 mL
QC Batch: 0614869

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
14797-73-0	Perchlorate	10.0	ug/L	1	10.0	1.84	U	12/19/06 15:22

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 11/7/07
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
_X__ SW-846
_X__ Project QAPP/SAP

Project Name: SWMU 54
Project Number:
Laboratory: TriMatrix
SDG No.: 36440-32
Test Name: Explosives
Method No.: 8330

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 ^{O}C, then flag L(+)/UL(-).			
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve? If no, flag "R".	✓		
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".	✓		
4.3	Were continuing calibration standards analyzed every 12 hours or twenty samples? If no, flag "R".	✓		
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±15%) or %D(≤15%) within	✓		
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>15%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 15%, J(+), only. Negative Bias - %D>-15% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes:

5.0 Laboratory Control Sample (LCS)		Yes	No	NA
5.1	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.2	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
5.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		✓	

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.2	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			✓
6.3	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓
	<10% low high			
	Positives L L K			
	Non-detects R UL No action			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional judgement.			

Notes: The MS/MSD for 54MW2 > QC for
2,6-dinitrotoluene 335%/331%. >135%. Parent ND → No action
<QC for octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine 56%/42%.
Parent pos → J, m < 80%.
and for the confirmation sample 2,4-DNT 209%/213%.
octahydro — 132%/117%.

8.0 Field Duplicate		Yes	No	NA
8.1	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: NR-PW-6 and DUP-3 Both NDs ✓ NR-SW-8 and DUP-4 Both NPs ✓ 54MW3 and DUP-5 2-Amino 0.8 J 0.77 J OK ✓
54MW3 and DUP-5 4-Amino [redacted] J 0.91 J OK ✓
54MW3 and DUP-5 1,3,5-TNB 0.26 J ND OK ✓ 2,4,6-TNT 0.85 J 0.78 J OK ✓ Octahydro 3.[redacted] J 3.4 J OK ✓

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	✓		
10.1.1	Number of samples:			
10.1.2	Number of target compounds in each analysis: 14			
10.1.3	Number of results rejected or not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8330

54MW2

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Water

SDG: 36440-32

Project: RFAAP SWMU 54 RFI/CMS

Preparation: 8330 Extraction

Initial/Final: 770 mL / 10 mL

Laboratory ID: 0614210-MS1

QC Batch: 0614210

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	0.625	3.09	95	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	ND	2.48	95	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	5.56	7.91	90	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	ND	2.71	104	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	ND	8.71	335 *	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	3.59	8.64	97	50 - 155	ug/L
2-Nitrotoluene	2.60	ND	2.37	91	45 - 135	ug/L
3-Nitrotoluene	2.60	ND	2.55	98	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	3.06	5.64	99	55 - 155	ug/L
4-Nitrotoluene	2.60	ND	3.08	118	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.60	ND	2.50	96	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	ND	2.32	89	20 - 175	ug/L
Nitrobenzene	2.60	ND	2.44	94	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5,	2.60	9.28	10.7	56 *	80 - 115	ug/L

7-tetrazocine

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00105

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

54MW2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Water

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL

Laboratory ID: 0614210-MSD1
QC Batch: 0614210

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	2.91	88	6	20	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	2.38	92	4	20	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	7.87	89	0.4	20	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	2.54	98	6	20	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	8.59	331 *	1	20	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	8.40	93	3	20	50 - 155	ug/L
2-Nitrotoluene	2.60	2.28	88	4	20	45 - 135	ug/L
3-Nitrotoluene	2.60	2.54	98	0.4	20	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	5.45	92	3	20	55 - 155	ug/L
4-Nitrotoluene	2.60	2.87	111	7	20	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.60	2.38	92	5	20	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	2.18	84	6	20	20 - 175	ug/L
Nitrobenzene	2.60	2.50	96	2	20	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5	2.60	10.4	42 *	4	20	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

00106

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8330

54MW2

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Water

SDG: 36440-32

Project: RFAAP SWMU 54 RFI/CMS

Preparation: 8330 Extraction

Initial/Final: 770 mL / 10 mL

Laboratory ID: 0614210-MS2

QC Batch: 0614210

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	0.624	3.11	96	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	ND	2.61	100	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	6.06	8.17	81	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	ND	5.44	209 *	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	ND	2.79	107	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	3.56	8.25	90	50 - 155	ug/L
2-Nitrotoluene	2.60	ND	3.05	118	45 - 135	ug/L
3-Nitrotoluene	2.60	ND	2.61	101	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	3.06	5.69	101	55 - 155	ug/L
4-Nitrotoluene	2.60	ND	2.70	104	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.60	ND	2.48	95	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	ND	2.35	90	20 - 175	ug/L
Nitrobenzene	2.60	ND	2.51	96	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5	2.60	7.75	11.2	132 *	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00107

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8330

54MW2

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Water

SDG: 36440-32

Project: RFAAP SWMU 54 RFI/CMS

Preparation: 8330 Extraction

Initial/Final: 770 mL / 10 mL

Laboratory ID: 0614210-MSD2

QC Batch: 0614210

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	3.22	100	3	20	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	2.65	102	2	20	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	8.44	92	3	20	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	5.52	213 *	1	20	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	2.76	106	1	20	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	8.35	92	1	20	50 - 155	ug/L
2-Nitrotoluene	2.60	3.02	116	1	20	45 - 135	ug/L
3-Nitrotoluene	2.60	2.54	98	3	20	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	5.65	100	0.6	20	55 - 155	ug/L
4-Nitrotoluene	2.60	2.66	103	1	20	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.60	2.64	102	6	20	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	2.40	92	2	20	20 - 175	ug/L
Nitrobenzene	2.60	2.63	101	5	20	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5	2.60	10.8	117 *	3	20	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00108

Quality Control Results – Nitroaromatic Explosives

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications for both the primary and confirmation columns were method-compliant.

Method Blanks

No target analytes were detected.

Surrogates

All surrogate recoveries were in control for both the primary column and confirmation column runs.

Laboratory Control Samples

Each Laboratory Control Sample (LCS) was fortified with all target analytes. All recoveries were in control for both the primary column and confirmation column runs.

Matrix Spikes

Samples '54MW2' and 'NR-SW-5' were fortified with all target analytes. All recoveries and RPDs were in control. Since there were detections for some of the target analytes in sample '54MW2', the MS/MSD was also analyzed on the confirmation column and reported.

Sample Results

See Section B. Second-column analysis was needed for nine samples due to tentative detections of one or more target analytes on the primary column. Those confirmation analyses are identified by the laboratory sample ID plus an 'RE1' suffix. The confirmation analyses were performed at a different date and time and, for the two samples for which a tentative detection was confirmed, summary forms and raw data have been included following that for the primary column. Where an analyte was confirmed, the primary column result has been reported (both RPDs were less than 40%). For the remaining seven samples that did not confirm, raw data (only) has been included at the end of the 'Preparation Logs/Miscellaneous Confirmation Column' subsection.

Statements of Data Qualification

See Narrative Attachment 2.

This report shall not be reproduced except in full, without written authorization of TriMatrix Laboratories, Inc.
Individual sample results relate only to the sample tested.

STATEMENT OF DATA QUALIFICATIONS

Nitroaromatics & Nitramines by EPA Method 8330

Qualification:	The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.	
Analysis:	USEPA-8330	
Sample/Analyte:	0612019-05 54MW2	2,6-Dinitrotoluene
	0612019-05RE1 54MW2	2,4-Dinitrotoluene
Qualification:	The MS or MSD recovery, but not both, was outside the control limit. The RPD is within the control limit. The unspiked sample result is considered estimated.	
Analysis:	USEPA-8330	
Sample/Analyte:	0612019-05 54MW2	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 1/19/07
DV Level: II III IV

Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
X project QAPP

Project Name: Radford SWMU 54
Project Number:
Laboratory: TriMatrix
SDG No.: 36440-32
Test Name: Pest / PCBs
Method No.: 8081 / 8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 ^{o}C, then flag L(+)/UL(-).			
1.5	Do any soil samples contain more than 50% water? If yes, no dry weight correction is made and make notes in the DV Report.			✓

Notes:

2.0 Holding Times		Yes	No	NA
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks prepared at the appropriate frequency (one per 20 samples or batch and matrix)?	✓		
3.2	Do any blanks have positive results? If yes, positive sample results should be reported and qualified "B", if the [sample≤5X[blank].		✓	
3.3	Do any field equipment blanks have positive results? If yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve for 1016, 1260, toxaphene, and technical chlordane; and at least one point for the other arochlors reported? If no, flag "R".	✓		
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".	✓		
4.3	Were continuing calibration standards analyzed every 12 hours or twenty samples? If no, flag "R".	✓		
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±15%) or %D(≤15%) within the control limits?	✓		
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>15%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 15%, J(+), only. Negative Bias - %D>-15% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes:

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning, every 12 hours, and at the end of every sequence.	✓		
5.2	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non detect DDT results, DDD/DDE - R(+).	✓		
5.3	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	✓		
5.4	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	✓		

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Advisory limit: 60-150%.	✓		
6.3	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			✓
6.4	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
1 out	high/low	No action	No action
2 out	2 high same column	K	No action
	2 low same column	L, UL	No action
	mixed same column	J, UJ	No action
	2 high diff columns	J	Not applicable
	2 low diff columns	J, UJ	Not applicable
	mixed diff columns	Professional judgement	Not applicable
3 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	2 high, 1 low	K (2 high)	J (1 low 2nd column)
	2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
	other mixed	J, UJ	Not applicable
4 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	Mixed	J, UJ	Not applicable

If any recovery is >0% and <10% then L(+)/R(-).
If any recovery is 0% then R(+/-).

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data.			

Notes: MS/MSD for 54MW2

Pest → alpha-BHC <60% 55%/56% UJm in Parent
beta-BHC 7125% 276%/251% RPD 79%?QC
2nd column 46% 21% UJm in Parent
gamma-BHC ?QC 570%/593%
Gamma-Chlordane ?QC 186%/171%

Endosulfan I ?QC 607%/613%
Heptachlor ?QC 441%/414%

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.2	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 54MW3 and DUP-5 Both NDs ✓

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns <40%? If No, J(+).			✓
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	✓		
11.1.1	Number of samples: Pest_____ PCB_____			
11.1.2	Number of target compounds in each analysis: PEST_____ PCB_____			
11.1.3	Number of results rejected and not reported: Pest_____ PCB_____			
11.1.4	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = Pest 100%. PCB 100%.			

Notes:

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8081A

54MW2

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Water

SDG: 36440-32

Project: RFAAP SWMU 54 RFI/CMS

Preparation: 3510C Liquid-Liquid Extraction

Initial/Final: 1060 mL / 2 mL

Laboratory ID: 0614201-MS1

QC Batch: 0614201

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
alpha-BHC	0.0755	ND	0.0413	55 *	60 - 130	ug/L
alpha-BHC [2C]	0.0755	ND	0.0645	86	60 - 130	ug/L
beta-BHC	0.0755	ND	0.208	276 *	65 - 125	ug/L
beta-BHC [2C]	0.0755	ND	0.0362	48 *	65 - 125	ug/L
gamma-BHC (lindane)	0.0755	ND	0.0638	84	25 - 135	ug/L
gamma-BHC (Lindane) [2C] No flag	0.0755	ND	0.430	570 *	25 - 135	ug/L
delta-BHC	0.0755	ND	0.0879	116	45 - 135	ug/L
delta-BHC [2C]	0.0755	ND	0.0815	108	45 - 135	ug/L
alpha-Chlordane	0.0755	ND	0.0534	71	65 - 125	ug/L
alpha-Chlordane [2C] No flag	0.0755	ND	0.0691	92	65 - 125	ug/L
gamma-Chlordane No flag	0.0755	ND	0.141	186 *	60 - 125	ug/L
gamma-Chlordane [2C]	0.0755	ND	0.0634	84	60 - 125	ug/L
4,4'-DDD	0.0755	ND	0.0670	89	25 - 150	ug/L
4,4'-DDD [2C]	0.0755	ND	0.0675	90	25 - 150	ug/L
4,4'-DDE	0.0755	ND	0.0662	88	35 - 140	ug/L
4,4'-DDE [2C]	0.0755	ND	0.0683	90	35 - 140	ug/L
4,4'-DDT	0.0755	ND	0.0672	89	45 - 140	ug/L
4,4'-DDT [2C]	0.0755	ND	0.0653	86	45 - 140	ug/L
Aldrin	0.0755	ND	0.0843	112	25 - 140	ug/L
Aldrin [2C]	0.0755	ND	0.0457	60	25 - 140	ug/L
Dieldrin	0.0755	ND	0.0777	103	60 - 130	ug/L
Dieldrin [2C]	0.0755	ND	0.0647	86	60 - 130	ug/L
Endosulfan I No flag	0.0755	ND	0.458	607 *	50 - 110	ug/L
Endosulfan I [2C]	0.0755	ND	0.0672	89	50 - 110	ug/L
Endosulfan II	0.0755	ND	0.0572	76	30 - 130	ug/L
Endosulfan II [2C]	0.0755	ND	0.0568	75	30 - 130	ug/L
Endosulfan Sulfate	0.0755	ND	0.0743	98	55 - 135	ug/L
Endosulfan Sulfate [2C]	0.0755	ND	0.0649	86	55 - 135	ug/L
Endrin	0.0755	ND	0.0664	88	55 - 135	ug/L
Endrin [2C]	0.0755	ND	0.0638	84	55 - 135	ug/L
Endrin Aldehyde	0.0755	ND	0.0568	75	55 - 135	ug/L
Endrin Aldehyde [2C]	0.0755	ND	0.0662	88	55 - 135	ug/L
Endrin Ketone	0.0755	ND	0.0662	88	75 - 125	ug/L

00646

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8081A

54MW2

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Water

SDG: 36440-32

Project: RFAAP SWMU 54 RFI/CMS

Preparation: 3510C Liquid-Liquid Extraction

Initial/Final: 1060 mL / 2 mL

Laboratory ID: 0614201-MS1

QC Batch: 0614201

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Endrin Ketone [2C]	0.0755	ND	0.0657	87	75 - 125	ug/L
Heptachlor No flag	0.0755	ND	0.333	441 *	40 - 130	ug/L
Heptachlor [2C]	0.0755	ND	0.0921	122	40 - 130	ug/L
Heptachlor Epoxide	0.0755	ND	0.0600	80	60 - 130	ug/L
Heptachlor Epoxide [2C]	0.0755	ND	0.0713	94	60 - 130	ug/L
Methoxychlor	0.0755	ND	0.0621	82	55 - 150	ug/L
Methoxychlor [2C]	0.0755	ND	0.0700	93	55 - 150	ug/L
Toxaphene		ND	ND		43 - 126	ug/L
Toxaphene [2C]		ND	ND		43 - 126	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00647

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8081A

54MW2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Water

SDG: 36440-32
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3510C Liquid-Liquid Extraction
Initial/Final: 1060 mL / 2 mL

Laboratory ID: 0614201-MSD1
QC Batch: 0614201

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
alpha-BHC	0.0755	0.0421	56 *	2	20	60 - 130	ug/L
alpha-BHC [2C]	0.0755	0.0640	85	0.9	20	60 - 130	ug/L
beta-BHC	0.0755	0.190	251 *	9	17	65 - 125	ug/L
beta-BHC [2C]	0.0755	0.0157	21 *	79 *	17	65 - 125	ug/L
gamma-BHC (lindane)	0.0755	0.0643	85	0.9	14	25 - 135	ug/L
gamma-BHC (Lindane) [2C]	0.0755	0.448	593 *	4	14	25 - 135	ug/L
delta-BHC	0.0755	0.0849	112	3	20	45 - 135	ug/L
delta-BHC [2C]	0.0755	0.0796	106	2	20	45 - 135	ug/L
alpha-Chlordane	0.0755	0.0557	74	4	20	65 - 125	ug/L
alpha-Chlordane [2C]	0.0755	0.0685	91	0.8	20	65 - 125	ug/L
gamma-Chlordane	0.0755	0.129	171 *	9	20	60 - 125	ug/L
gamma-Chlordane [2C]	0.0755	0.0636	84	0.3	20	60 - 125	ug/L
4,4'-DDD	0.0755	0.0683	90	2	20	25 - 150	ug/L
4,4'-DDD [2C]	0.0755	0.0681	90	0.8	20	25 - 150	ug/L
4,4'-DDE	0.0755	0.0662	88	0	20	35 - 140	ug/L
4,4'-DDE [2C]	0.0755	0.0683	90	0	20	35 - 140	ug/L
4,4'-DDT	0.0755	0.0681	90	1	20	45 - 140	ug/L
4,4'-DDT [2C]	0.0755	0.0655	87	0.3	20	45 - 140	ug/L
Aldrin	0.0755	0.0762	101	10	18	25 - 140	ug/L
Aldrin [2C]	0.0755	0.0436	58	5	18	25 - 140	ug/L
Dieldrin	0.0755	0.0764	101	2	19	60 - 130	ug/L
Dieldrin [2C]	0.0755	0.0657	87	1	19	60 - 130	ug/L
Endosulfan I	0.0755	0.462	613 *	0.9	20	50 - 110	ug/L
Endosulfan I [2C]	0.0755	0.0662	88	1	20	50 - 110	ug/L
Endosulfan II	0.0755	0.0577	76	1	20	30 - 130	ug/L
Endosulfan II [2C]	0.0755	0.0575	76	1	20	30 - 130	ug/L
Endosulfan Sulfate	0.0755	0.0736	98	1	17	55 - 135	ug/L
Endosulfan Sulfate [2C]	0.0755	0.0651	86	0.3	17	55 - 135	ug/L
Endrin	0.0755	0.0672	89	1	20	55 - 135	ug/L
Endrin [2C]	0.0755	0.0643	85	0.9	20	55 - 135	ug/L
Endrin Aldehyde	0.0755	0.0589	78	4	18	55 - 135	ug/L
Endrin Aldehyde [2C]	0.0755	0.0658	87	0.6	18	55 - 135	ug/L
Endrin Ketone	0.0755	0.0666	88	0.6	20	75 - 125	ug/L
Endrin Ketone [2C]	0.0755	0.0662	88	0.9	20	75 - 125	ug/L

00648

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8081A

54MW2

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Water

SDG: 36440-32

Project: RFAAP SWMU 54 RFI/CMS

Preparation: 3510C Liquid-Liquid Extraction

Initial/Final: 1060 mL / 2 mL

Laboratory ID: 0614201-MSD1

QC Batch: 0614201

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Heptachlor	0.0755	0.312	414 *	7	20	40 - 130	ug/L
Heptachlor [2C]	0.0755	0.0806	107	13	20	40 - 130	ug/L
Heptachlor Epoxide	0.0755	0.0606	80	0.9	20	60 - 130	ug/L
Heptachlor Epoxide [2C]	0.0755	0.0704	93	1	20	60 - 130	ug/L
Methoxychlor	0.0755	0.0630	84	2	20	55 - 150	ug/L
Methoxychlor [2C]	0.0755	0.0698	92	0.3	20	55 - 150	ug/L
Toxaphene		ND			20	43 - 126	ug/L
Toxaphene [2C]		ND			20	43 - 126	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00649

Quality Control Results – Chlorinated Pesticides

Note: second column (confirmation) data is identified as the compound[2C].

Calibration

Initial instrument calibrations, second source verification (SCV), and continuing calibration verifications (CCV) for both the primary and confirmation columns were method-compliant. However, neither a SCV nor a CCV was analyzed for Toxaphene. Toxaphene is a multi-component pesticide, the referenced method does not require a CCV for multi-component pesticides, and it is assumed that a compliant CCV comprised of single-component pesticides demonstrates the same for a multi-component analyte (i.e., Toxaphene). The DoD QSM is not clear on the matter. The absence of a SCV for Toxaphene was due to laboratory oversight.

Method Blank

No target analytes were detected.

Surrogates

All surrogate recoveries were in control for both the primary column and confirmation column runs.

Laboratory Control Sample

The Laboratory Control Sample (LCS) was fortified with all single-component target analytes. All recoveries were in control for both the primary column and confirmation column runs. A second LCS for Toxaphene was not analyzed due to laboratory oversight.

Matrix Spikes

Sample '54MW2' was fortified with all single-component target analytes. Most recoveries and RPDs for both the primary column and confirmation column runs were in control; see the MS/MSD summary forms and text qualifiers for details. There was not sufficient sample volume for a second MS/MSD for Toxaphene-only and it is unclear from the DoD QSM whether one is needed.

Sample Results

Please see Section D of the data package. No analytes required confirmation. Due to sample matrix interference, sample '54MW2' and the matrix spike and matrix spike duplicate of that samples could not be evaluated for five target analytes. The sample extract(s) as well as the associated method blank and LCS underwent florisil cleanup and were reanalyzed with no improvement in sample chromatography. Results for the initial sample analyses have been reported and raw data (only) for the reanalyses-with-cleanup are provided at the end of the "Preparation Logs/Miscellaneous" subsection.

Statements of Data Qualification

See Narrative Attachment 2.

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Individual sample results relate only to the sample tested.

Data Review and Approval

All data was reviewed and approved by the group supervisor/manager prior to further review by data management staff and the project chemist.

Data Deliverables

The data deliverables, both hardcopy and electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD has been issued separate from this hardcopy report.

Walt Roudebush, Project Chemist

1/16/07
Date

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DATA VALIDATION WORKSHEET

Perchlorate

Reviewer: RA
Date: 1/18/07
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number:
Laboratory: TriMatrix
SDG No.: 36440-32
Test Name: Perchlorate
Method No.: E314.0

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample collection, preservation, shipping, and storage condition meet the project controlling documents?	✓		
	Action: No chemical preservation required.			✓
2.2	Have any technical holding times (28 days), determined from date of sampling to date of analysis, (including dilution or reanalysis) been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks prepared at the appropriate frequency? If not, note in DV report.	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the [sample]≤ 5X[associated blank].		✓	
3.3	Do any field equipment blanks blanks have positive results? If Yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve?If no apply R flags.	✓		
4.2	Are all initial calibration correlation coefficient within the control limits (r>0.99)?If no J(+), R (-)	✓		
4.3	Was a instrument performance check (IPC) analyzed at the matrix conductivity threshold (MCT)? If no, verify that the sample chromatograms do not display this interference.	✓		
4.4	Is the $Pd_{A/H}$ < 25% , %recovery between 80-120%, and the retention time shift < 5%, If no, R flag to all results for samples that display this type of interference.	✓		
4.5	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Control limit is <+/- 15%. If no, R (-), J (+).	✓		

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
5.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?			✓
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data.			

Notes:

6.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
6.1	Is the LCS/LCSD recovery form present?	✓		
6.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are %R for LCS/LCSD recoveries outside the QC limits(85-115%)? If Yes, for %R > UCL, J(+) only; for %R < LCL,		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits(i.e., 15%)? If Yes, J(+) only.			✓

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
	For sample results > 5 x RL, use 50% RPD. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 x RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV	✓		

Notes:

All were non-detects.

8.0 aboratory Duplicates		Yes	No	NA
8.1	Was a labduplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
8.2	Are all analyte duplicate results within control limits? If no, J(+) only.	✓		

Notes:

9.0 Detection Limit Verification		Yes	No	NA
9.1	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
9.2	Were sample concentrations above the highest standard run at a dilution? If not, note in DV report.			✓

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	✓		
10.2	Number of samples:			
10.3	Number of target compounds in each analysis:			
10.4	Number of results rejected and not reported:			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Notes:

Quality Control Results – Perchlorate

Calibration

All instrument calibrations were method-compliant.

Method Blanks

There were no detections.

Laboratory Control Samples

All Laboratory Control Sample recoveries were in control.

Matrix Spikes

Samples '54MW2' and 'NR-SW-5' were fortified (MS-only, no MSD). Both recoveries (67%, 65%) were in control.

Laboratory Duplicates

Samples '54MW2' and 'NR-SW-5' were analyzed in duplicate; both RPDs were in control.

Sample Results

Please see Section C of the data package.

Corrective Actions

No corrective actions were needed.

Statement of Data Qualifications

No statements were generated.

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Individual sample results relate only to the sample tested.

Sample Receipt and Log-in

There were four receipt events.

Receipt Event One

On November 30, 2006 at 09:00 hrs, three sample coolers containing multiple aqueous samples were received at TriMatrix via FedEx (the carrier). The coolers had been shipped from the Site on November 29.

The external custody seal affixed to each cooler was intact. The samples were received on ice and in good condition. The receipt temperature of the interior of each cooler was measured via a 'temperature blank' shipped in it; the measured temperatures, in °C, were 1.8, 1.3, and 1.9.

Shipping documents included three field chains-of-custody forms (COC) and associated carrier air bills.

Sample '54MW2' was designated by the Client for MS/MSD analysis for all target parameters.

Samples were assigned to Work Order 0612019 and SDG 36440-32.

Receipt Event Two

On December 1, 2006 at 13:00 hrs, three sample coolers containing multiple aqueous samples were received at TriMatrix via FedEx (the carrier). The coolers had been shipped from the Site on November 30.

The external custody seal affixed to each cooler was intact. All samples were received on ice and most were in good condition. However, one 1-liter amber for each of three samples was received broken. The receipt temperature of the interior of each cooler was measured via a 'temperature blank' shipped in it; the measured temperatures, in °C, were 0.8, 2.1, and 0.9.

Shipping documents included three field chains-of-custody forms (COC) and associated carrier air bills.

Sample 'NR-SW-5' was designated by the Client for MS/MSD analysis for Method 8330 Explosives and Perchlorate.

Samples were assigned to Work Order 0612020 and SDG 36440-32.

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Receipt Event Three

On December 2, 2006 at 09:25 hrs, three sample coolers containing multiple aqueous samples were received at TriMatrix via FedEx (the carrier). The coolers had been shipped from the Site on December 1.

The external custody seal affixed to each cooler was intact. All samples were received on ice and most were in good condition. However, one 1-liter amber for one sample '54MW9' was received broken and a second 1-liter amber for the same sample was received with a loose cap and low sample volume. Sample from that second container was not used. Two additional 1-liter ambers for this sample were received intact. The receipt temperature of the interior of each cooler was measured via a 'temperature blank' shipped in it; the measured temperatures, in °C, were 2.1, 1.2, and 4.2.

Shipping documents included three field chains-of-custody forms (COC) and associated carrier air bills.

No sample was designated by the Client for MS/MSD analysis.

Samples were assigned to Work Order 0612021 and SDG 36440-32.

Receipt Event Four

On December 6, 2006 at 08:45 hrs, one sample cooler containing multiple aqueous samples was received at TriMatrix via FedEx (the carrier). The cooler had been shipped from the Site on December 5.

The external custody seal affixed to the cooler was intact. All samples were received on ice. However, one 1-liter amber for each of two samples was received broken. The receipt temperature of the interior of each cooler was measured via a 'temperature blank' shipped in it; the measured temperature, in °C, was 1.9.

Shipping documents included one field chain-of-custody forms (COC) and associated carrier air bill.

No sample was designated by the Client for MS/MSD analysis.

Samples were assigned to Work Order 0612079 and SDG 36440-32.

All Events

Copies of all referenced receipt and custody documents are provided in Section A of this data package. Correspondence regarding completed sample log-in activities will be found in Attachment 1 of this narrative.

Provision of Sample Receipt Information to Client

A copy of the COCs and receipt checklist were transmitted to the Client within one day of sample receipt. The Client did not request any modification(s) to the analyses, as listed on the COC.

Post-Receipt Sample Custody

Custody of the sample during sample preparation (if applicable) and analysis was assigned to individual analysts. Copies of completed 'internal chain of custody' forms are included in Section A.

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Individual sample results relate only to the sample tested.

Variances

Data Qualifier Flags

Data qualifier flags other than those listed in the DoD QSM were employed or the definition of an existing flag was modified.

J – Estimated: the analyte was detected at a concentration greater than the limit of detection (i.e., MDL) but less than the reporting limit (i.e., MRL).

B – Blank contamination: The analyte was detected above one-half the reporting limit in an associated method blank. The same analyte in the sample was detected at less than five times the method blank concentration. (If a common laboratory contaminant is present in the method blank at a concentration greater than one-half the reporting limit but less than or equal to that reporting limit, any associated sample results are flagged but corrective action is not necessarily taken. A text qualifier is also associated with such a result.)

E – Exceeds calibration range: The analyte response exceeded the calibrated range of the instrument. (With the exception of metals for which only the final non-qualified result is reported, both the initial E-qualified result and final non-qualified result from reanalysis-at-dilution are reported.)

Text Qualifier

A LIMS-generated text qualifier is substituted for many instances in which the DoD QSM "Q" flag would otherwise apply. The text qualifiers are listed in a summary format by parameter with applicable samples identified.

Method 6020A

The acceptance criterion of < 2 x RL was substituted for < 2 x MDL for interference check solution ICS-A.

Analytical Methods

Sample preparation and analytical methods that were employed are per the SOW.

Method Detection Limits, Target Analytes, and Reporting Limits

All method detection limits (MDL) for analytes in this report are compliant with the DoD QSM specification that each reporting limit (RL) employed is to be at least three times the MDL. In addition, no RL is less than the equivalent concentration of the lowest instrument calibration standard. The target analyte list was specified by the Client. Proposed RLs were submitted by TriMatrix to the Client prior to the receipt of any samples.

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Project-specific Analytes of Concern

No project-specific analytes of concern were identified in the SOW.

Quality Control Limits

Quality control limits specified in the DoD QSM were employed. Although Method 6010B LCS recovery limits are specified in the QSM, limits for Method 6020A are not. However, Method 6010B limits from the QSM were employed for Method 6020A.

Hold Times

All samples were extracted/digested (where applicable) and analyzed within hold time.

Technical Issues

There were no general technical issues. Any issues unique to a particular parameter will be discussed in the QC section for it.

Sample Result Reporting Convention

Sample results are reported as RL 'U' (e.g., 0.001 U) if the target analyte was not detected above the MDL. If a sample for an organic parameter is reanalyzed and also reported, the second analysis includes the suffix 'REn' where n = the first, second, etc. reanalysis. If a sample for an organic parameter is reanalyzed for confirmation purposes and also reported, the second analysis includes the suffix 'RE1'.

Data Qualifier Designation

If applicable, a sample result is qualified with:

- a "U" flag if the analyte was not detected at a concentration greater than the MDL,
- a "B", "J", and/or an "E" flag as defined in the preceding Variance section,
- a LIMS-generated statement of qualification. Qualifying statements, if any, will be found in Attachment 2 to this narrative.

QC Batch and Analytical Batch Designation

A QC Batch is a seven digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation); it is limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.).

An Analytical Batch (or Sequence) is a seven digit number that associates all samples analyzed as a set under one analytical sequence.

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Individual sample results relate only to the sample tested.

STATEMENT OF DATA QUALIFICATIONS

Organochlorine Pesticides by EPA Method 8081A

Qualification:	Concentration exceeds calibration range	
Analysis:	USEPA-8081A	
	0614201-MS1	Endosulfan I
	0614201-MS1	gamma-BHC (Lindane) [2C]
	0614201-MS1	Heptachlor
	0614201-MSD1	Endosulfan I
	0614201-MSD1	gamma-BHC (Lindane) [2C]
	0614201-MSD1	Heptachlor
Qualification:	Because of sample matrix interference, the analytical result obtained for this analyte is unusable.	
Analysis:	USEPA-8081A	
Sample/Analyte:	0612019-05 54MW2	alpha-BHC
	0612019-05 54MW2	beta-BHC
	0612019-05 54MW2	beta-BHC [2C]
	0612019-05 54MW2	Endosulfan I
	0612019-05 54MW2	gamma-BHC (Lindane) [2C]
	0612019-05 54MW2	Heptachlor
	0614201-MS1	alpha-BHC
	0614201-MS1	beta-BHC
	0614201-MS1	beta-BHC [2C]
	0614201-MS1	Endosulfan I
	0614201-MS1	gamma-BHC (lindane)
	0614201-MS1	Heptachlor
	0614201-MSD1	alpha-BHC
	0614201-MSD1	beta-BHC
	0614201-MSD1	beta-BHC [2C]
	0614201-MSD1	Endosulfan I
	0614201-MSD1	gamma-BHC (lindane)
	0614201-MSD1	Heptachlor
Qualification:	Sample and ms/msd were analyzed, then sent back for cleanup. The cleaned up samples were re-analysed on 12/19/06. The re-analysis of the cleaned up samples had the same contamination problems. The original was reported.	
Analysis:	USEPA-8081A	
Sample/Analyte:	0612019-05 54MW2	
	0614201-MS1	
	0614201-MSD1	
Qualification:	The MS and/or MSD recovery was outside the control limit. The non-spiked sample result is considered estimated.	
Analysis:	USEPA-8081A	
Sample/Analyte:	0612019-05 54MW2	alpha-BHC
	0612019-05 54MW2	beta-BHC [2C]
Qualification:	The MS and/or MSD recovery exceeded the upper control limit. The non-spiked sample result for the same analyte was non-detect and is not qualified.	
Analysis:	USEPA-8081A	
Sample/Analyte:	0612019-05 54MW2	beta-BHC

Continued on next page

STATEMENT OF DATA QUALIFICATIONS

Organochlorine Pesticides by EPA Method 8081A (Continued)

Qualification:	The MS and/or MSD recovery exceeded the upper control limit. The non-spiked sample result for the same analyte was non-detect and is not qualified.	
Analysis:	USEPA-8081A	
Sample/Analyte:	0612019-05 54MW2	Endosulfan I
	0612019-05 54MW2	gamma-BHC (Lindane) [2C]
	0612019-05 54MW2	gamma-Chlordane
	0612019-05 54MW2	Heptachlor

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Chain of Custody Record

COC No. 117014

Page 1 of 1

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Cart: 4
VOA Rack/Tray: —
Receipt Log No.: 2335
Project Chemist: CMR
Laboratory Project No.: E-06120 19

Client Name: ~~RT~~ URS Corp.
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone: 804.965.9000
Fax: 804.965.9764

Project Name: SMMU 54
Client Project No. / P.O. No.: 11653651
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Container Type (corresponds to Container Packing List): A A A
8330 8081A, 8082 Perchlorate

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted			Total	Sample Comments
04	WG	01	1	54MW6	TM1578	11/29/06	1100		X	GW	2	2	1	5	
04	WG	02	2	54MW1	↓	11/29/06	1355		X	GW	2	2	1	5	
			3												
			4												
			5												
			6												
			7												
			8												
			9												
			10												

Sampled By (print): David Copen
Sampler's Signature: David Copen
Company: URS Corp

How Shipped? Hand Carrier: Fed Ex
Tracking No.:

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
David Copen	11/29/06	1630						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						William Cole	11-30-06	0845

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Chain of Custody Record

COC No. 116935

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Cart: 4
VOA Rack/Tray: —
Receipt Log No.: 23.5
Project Chemist: WDC
Laboratory Project No.: E-061201 09

Client Name: URS Corp.
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone: 804.965.9000
Fax: 804.965.9764

Project Name: SWMU 54
Client Project No. / P.O. No.: 11656351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

	Container Type (corresponds to Container Packing List)															
	A	A	A													
	8330	6010A, 6020	Perchlorate													
	2	2	3												Total	
	Number of Containers Submitted															

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix				Sample Comments
04	GW	03	1	54MW5	TM1569	11/29/06	1705		X	GW	✓	✓	✓	
05 ~~02~~	GW	04	2	EQBK-1	↓	11/29/06	1715		X	BW	✓	✓	✓	BW = Blank water
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10											

Sampled By (print): David Copen
Sampler's Signature: David Copen
Company: URS Corp.

How Shipped? Hand Carrier Fed Ex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
David Copen	11/29/06	1730						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						William Cole	11-30-06	0875

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Chain of Custody Record

COC No. 116527

Page 1 of 1

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Cart: 4
VOA Rack/Tray: —
Receipt Log No.: 2315
Project Chemist:
Laboratory Project No.: E-Mel2019

Client Name: URS Corp.
Address: 5540 Falmouth St Suite 201
Richmond, VA 23230
Phone: 804.965.9000
Fax: 804.965.9764

Project Name: SWMU 54
Client Project No. / P.O. No.: 11652351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID		Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)										Total	Sample Comments
												A	A	A									PRESERVATIVES
												8330	8014, 8021	Perchlorate									A NONE pH~7 B HNO_3 pH<2 C H_2SO_4 pH<2 D 1+1 HCl pH<2 E NaOH pH>12 F ZnAc/NaOH pH>9 G MeOH H Other (note below)
												Number of Containers Submitted											
	06	WG	05	1	54MW2	TM1254	11/29/06	1505		X	GW	2	2	1								5	
				2	54MW2 MS/MSD	↓	↓	↓		X	GW	2	4									6	~~1~~ extra bottle for perchlorate
				3																			MS/MSD not needed nor collected.
				4																			
				5																			
				6																			
				7																			
				8																			
				9																			
				10																			

Sampled By (print): David Copen
Sampler's Signature: David Copen
Company: URS Corp

How Shipped? Hand Carrier Fed Ex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
David Copen	11/29/06	1635						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Willie Cole	11-30-06	0845

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COC No. 116943

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Cart: 2
VOA Rack/Tray: —
Receipt Log No.: 257
Project Chemist: [illegible]
Laboratory Project No.: E-061202O

Client Name: URS Corp.
Address: 5540 Falmouth St Suite 201
Richmond, VA 23230
Phone: 804.965.9000
Fax: 804.965.9764

Project Name: SWMU 54
Client Project No. / P.O. No.: 11656351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Container Type (corresponds to Container Packing List): A A A
Number of Containers Submitted: 2 2 3

S330
SOS1A, 8052
Perchlorate

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Total	Sample Comments
1	07	WS	01	NR-SW-6	TM1299	11/30/06	1330		X	SW	3	
2	08	WG	02	NR-PW-6	↓	11/30/06	1340		X	PW	3	
3	04	WG	03	54MW4	↓	11/30/06	1600		X	GW	5	i bruku
4												
5	09	WG	04	DUP-3	TM1299	11/30/06	—		X	PW	3	
6												
7												
8												
9												
10												

Sampled By (print): David Copen
Sampler's Signature: David Copen
Company: URS Corp

How Shipped? Hand Carrier Fed Ex
Tracking No.

Comments: SW = surface water
PW = pore water
GW = groundwater

1. Relinquished By	Date	Time
David Copen	11/30/06	1705

2. Relinquished By	Date	Time

3. Relinquished By	Date	Time

1. Received By	Date	Time

2. Received By	Date	Time

3. Received For Lab By	Date	Time
[illegible]	12-01-06	1330

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Cart: 2
VOA Rack/Tray: 1
Receipt Log No.: 257
Project Chemist: CWR
Laboratory Project No.: E-04120220

Client Name: URS Corporation
Address: 5540 Falmouth St, Suite 201
Richmond VA 23233
Phone 804 965 9000
Fax 804 965 9764

Project Name: SWMU54
Client Project No. / P.O. No.: 11656351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Container Type (corresponds to Container Packing List): A A
8330 Perchlorate

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
10	~~WS~~ WG	05	1	NR-SW-5 + MS/MSD	TM1403	11/30/06	12:40		X		6 4	7	E-ha container for Perchlorate for MS/MSD not required
08	WG	06	2	NR-PW-5		11/30/06	13:05		X		2 1	3	
07	WS	07	3	NR-SW-4		11/30/06	12:10		X		2 1	3	~~lab filter prior to analysis~~ CLB
11	WG	08	4	NR-PW-4		11/30/06	12:20		X		2 1	3	lab filter prior to analysis
			5										
			6										
			7										
			8										
			9										
			10										

Sampled By (print): David Copen
Sampler's Signature: David Copen
Company: URS Corp

How Shipped? Hand Carrier fedex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[illegible]	11/30/06	17:25						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
						[illegible]	12-01-06	1300

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COC No. 116944

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Cart: 2
VOA Rack/Tray: —
Receipt Log No.: 25.7
Project Chemist: WDR
Laboratory Project No.: E-0112020

Client Name: URS Corp
Address: 5540 Falmouth St Suite 201
Richmond, VA 23230
Phone: 804.965.9000
Fax: 804.965.9764

Project Name: SWMU 54
Client Project No. / P.O. No.: 11656351
Invoice To: [x] Client [ ] Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

A = NONE pH~7
B = HNO_3 pH<2
C = H_2SO_4 pH<2
D = 1+1 HCl pH<2
E = NaOH pH>12
F = ZnAc/NaOH pH>9
G = MeOH
H = Other (note below)

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List) 2	3	Total	Sample Comments
										Number of Containers Submitted			
07	WS	09	1 NR-SW-3	TM1274	11/30/06	1125		X	SW	2	1	3	
08	WG	10	2 NR-PW-3		11/30/06	1155		X	PW	2	1	3	
07	WS	11	3 NR-SW-2		11/30/06	1030		X	SW	2	1	3	
08	WG	12	4 NR-PW-2		11/30/06	1110		X	PW	2	1	3	
08	WG	13	5 NR-PW-1		11/30/06	910		X	PW	2	1	3	
07	WS	14	6 NR-SW-1		11/30/06	915		X	SW	2	1	3	
			7										
			8										
			9										
			10										

Sampled By (print): David Cogen
Sampler's Signature: David Cogen
Company: URS Corp

How Shipped? Hand Carrier: Fed Ex
Tracking No.:

	Relinquished By	Date	Time	Received By	Date	Time
1.	David Cogen	11/30/06	1720			
2.						
3.				3. Received For Lab By: William Cole	12-01-06	13:00

Comments: SW = surface water
PW = pore water

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COC No. 116947

Page 1 of 1

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Cart: 5
VOA Rack/Tray: --
Receipt Log No.: 27-3
Project Chemist: WJR
Laboratory Project No.: E-06012021

Client Name: URS Corp.
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone 804.965.9000
Fax 804.965.9764

Project Name: SWMU 54
Client Project No. / P.O. No.: 11656351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	8330 (A)	6081A, 8082 (A)	Perchlorate (A)	Total	Sample Comments
			Container Type (corresponds to Container Packing List)							2	2	3		
			Number of Containers Submitted											
04	GW	01	1 54MW8	TM1567	12/01/06	1440		X	GW	2	2	4	5	
04	GW	02	2 54MW10	↓	12/01/06	1550		X	GW	2	2	4	5	
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10											

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Sampled By (print): David Copen
Sampler's Signature: David Copen
Company: URS Corp

How Shipped? Hand Carrier Fed Ex
Tracking No.

Comments: * 4 empty ambers shipped as "space fillers".

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
David Copen	12/1/06	17:10						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						[illegible]	12/1/06	17:10

(2) ✓

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Chain of Custody Record

COC No. 116946

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Cart: 5
VOA Rack/Tray:
Receipt Log No.: 27.2
Project Chemist: WTR
Laboratory Project No.: E-04l2021

Client Name: URS Corp.
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone: 804.965.9000
Fax: 804.965.9764

Project Name: SWMU 54
Client Project No. / P.O. No.: 11656351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Container Type (corresponds to Container Packing List): 2 2 3
Number of Containers Submitted: A A A
Analyses: 8330 | 8081A, 8082 | Perchlorate

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Total	Sample Comments
1	34	GW	03	54MW9	TM14134	12/01/06	1320		X	GW	5	
2	38	GW	04	NR-PW-9		12/01/06	935		X	PW	3	
3	37	SW	05	NR-SW-90		12/01/06	1000		X	SW	3	
4	38	GW	04	NR-PW-10		12/01/06	1015		X	PW	3	
5												
6												
7												
8												
9												
10												

Sampled By (print): David Copen
Sampler's Signature: David Copen
Company: URS Corp

How Shipped? Hand Carrier: Fed Ex
Tracking No.:

Comments:
GW = groundwater
SW = surface water
PW = pore water

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
David Copen	12/1/06	17:10						

1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time

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TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 116939

Page 1 of 1

For Lab Use Only

Cart: 5
VOA Rack/Tray:
Receipt Log No.: 27-1
Project Chemist: WR
Laboratory Project No.: E-Oct2021

Client Name: URS Corp
Address: 5540 Falmouth St, Suite 201
Richmond, VA 23233
Phone (804) 965-9000
Fax 804-965-9764

Project Name: SWMU 54
Client Project No. / P.O. No.: 11656351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Container Type (corresponds to Container Packing List): A A | 2 3
Number of Containers Submitted: 8330 Perchlorate | 2 | 4

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Total	Sample Comments
~~24~~	WS	07	1	NR-SW-7	TM1647	12/1/06	7:50		X	SW	3	lab filter prior to analysis
~~26~~	WG	08	2	NR-PW-7			8:15		X	PW	3	lab filter prior to analysis
07	WS	09	3	NR-SW-8			8:35		X	SW	3	
~~28~~	WG	10	4	NR-PW-8			9:00		X	PW	3	lab filter prior to analysis
57	WS	11	5	NR-SW-9			9:20		X	SW	3	
2	W	12	6	DUP-4			—		X		3	
			7									
			8									
			9									
			10									

Sampled By (print): David Capen
Sampler's Signature: David Capen
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
David Capen	12/1/06	1710						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time

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Chain of Custody Record

COC No. 116948

Page 1 of 1

For Lab Use Only
Cart: 13
VOA Rack/Tray: –
Receipt Log No.: 33-19
Project Chemist: LVDR
Laboratory Project No.: E-0012079

Client Name: URS Corporation
Address: 5540 Falmouth St, Suite 201
Richmond VA 23230
Phone: (804) 965-9000
Fax: (804) 965-9764

Project Name: SWM054
Client Project No. / P.O. No.: 11656351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Ayan

Analyses Requested

Container Type (corresponds to Container Packing List): 2 3

Number of Containers Submitted: A A

5330/5052 Perchlorate

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix			Total	Sample Comments
04	W	01	1	54MW7	TH1419	12/5/06	11:50		X	GW	4	4	5	
04	W	02	2	54MW3	↓	12/5/06	12:40		X	GW	4	4	5	
14	W	03	3	DUP-5	↓	12/5/06	—		X	GW	4	4	5	
			4											
			5											
			6											
			7											
			8											
			9											
			10											

Sampled By (print): David Copen
Sampler's Signature: David Copen
Company: URS Corporation

How Shipped? Hand Carrier Fedex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	12/5/06	14:30						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
							12/6/06	8245

TriMatrixCOC -- COC

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Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-33 **Fraction:** Explosives, Pesticides, PCBs & Lead

Lab: TriMatrix **Project Name** Radford SWMU 54

Reviewer: RA **Date:** February 12, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: For the explosives analyses, the matrix spike duplicate analyzed for sample 54SB83B displayed a percent recovery (%R) greater than the upper control limit of 120% for 3-nitrotoluene at 124%. The associated parent sample result was non-detect and no data qualifying action was necessary.

For the pesticides analyses, the continuing calibration analyzed on 01/20/07 displayed percent differences (%Ds) greater than the control limit of 15% with a positive bias for beta-BHC and delta-BHC at 17%. The associated field sample results were non-detects and no data qualifying action was required.

For the PCBs analyses, PCB-1254 and/or PCB-1260 displayed %Ds greater than the control limit of 40% between the two analytical columns for several samples. These results were flagged "J,g" in the associated samples.

PCB-1254 exceeded the calibration range of the instrument in samples 54SB46A and 54SB46C and was flagged "E" by the laboratory. These results were flagged "J,q" by the reviewer. These samples were re-analyzed at dilution factor of 10 with acceptable results that should be used for data interpretation.

For the lead analyses, the serial dilution analyzed for sample 54SB81B displayed a %D greater than the control limit of 10% at 14%. Positive associated field sample results were flagged "J,s".

Correctable Anomalies: None.

TriMatrix
Laboratories, Inc.

SDG CASE NARRATIVE

URS Group, Inc.
Radford Army Ammunition Plant
SWMU 54

SDG – 36440-33
FEBRUARY 8, 2007

This case narrative is applicable to soil (and aqueous equipment blank) samples collected from SWMU54 at Radford Army Ammunition Plant (the Site), Radford, Virginia by URS Group, Inc. (the Client) and received by TriMatrix Laboratories, Inc. (TriMatrix) on January 10 through January 13, 2007. The samples were assigned to TriMatrix project sample delivery group (SDG) 36440-33 for analytical services (the Project) to be performed according to:

a) Subcontract NCA-06-1783, URS Project No. 11656351.30013,

b) the Scope of Work (SOW) for the above,

c) Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006 (by reference)

d) any verbal and written correspondence between the Client and TriMatrix as the Project progressed.

No part of this Project was subcontracted.

Field Sample and Assigned Laboratory Sample ID Summary

For the samples received, a field sample to laboratory sample ID cross-reference table follows below and on the next page.

Field Sample Name	Sample Matrix	Laboratory Sample ID	Date Sampled	Date Received
54SB42A	Soil	0701124-01	01/08/07	01/10/07
54SB42B	Soil	0701124-02	01/08/07	01/10/07
54SB42C	Soil	0701124-03	01/08/07	01/10/07
DUP-1	Soil	0701124-04	01/08/07	01/10/07
54SB46A	Soil	0701124-05	01/09/07	01/10/07
54SB46C	Soil	0701124-06	01/09/07	01/10/07
54SB3A	Soil	0701158-01	01/10/07	01/11/07
54SB3B	Soil	0701158-02	01/10/07	01/11/07
54SB3C	Soil	0701158-03	01/10/07	01/11/07
54SB10A	Soil	0701158-04	01/10/07	01/11/07
54SB10B	Soil	0701158-05	01/10/07	01/11/07
54SB10C	Soil	0701158-06	01/10/07	01/11/07

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Individual sample results relate only to the sample tested.

Field Sample and Assigned Laboratory Sample ID Summary – (continued)

Field Sample Name	Sample Matrix	Laboratory Sample ID	Date Sampled	Date Received
DUP2	Soil	0701158-07	01/10/07	01/11/07
54SB81A	Soil	0701158-08	01/10/07	01/11/07
54SB81B	Soil	0701158-09	01/10/07	01/11/07
54SB81C	Soil	0701158-10	01/10/07	01/11/07
DUP3	Soil	0701158-11	01/10/07	01/11/07
54SB33A	Soil	0701158-12	01/10/07	01/11/07
54SB22A	Soil	0701188-01	01/11/07	01/12/07
54SB22B	Soil	0701188-02	01/11/07	01/12/07
54SB22C	Soil	0701188-03	01/11/07	01/12/07
54SB57A	Soil	0701188-04	01/11/07	01/12/07
54SB83A	Soil	0701188-05	01/11/07	01/12/07
54SB83B	Soil	0701188-06	01/11/07	01/12/07
54SB83C	Soil	0701188-07	01/11/07	01/12/07
DUP-3	Soil	0701188-08	01/11/07	01/12/07
54SB84A	Soil	0701188-09	01/11/07	01/12/07
54SB84B	Soil	0701188-10	01/11/07	01/12/07
54SB84C	Soil	0701188-11	01/11/07	01/12/07
EQBK3	Water	0701188-12	01/11/07	01/12/07
EQBK3	Water	0701188-13	01/11/07	01/12/07
54SB23A	Soil	0701199-01	01/12/07	01/13/07
54SB23B	Soil	0701199-02	01/12/07	01/13/07
54SB23C	Soil	0701199-03	01/12/07	01/13/07
54SB32C	Soil	0701199-04	01/12/07	01/13/07
54SB82A	Soil	0701199-05	01/12/07	01/13/07
54SB82B	Soil	0701199-06	01/12/07	01/13/07
54SB82C	Soil	0701199-07	01/12/07	01/13/07
DUP4	Soil	0701199-08	01/12/07	01/13/07
EQBK-5	Water	0701199-09	01/12/07	01/13/07

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Individual sample results relate only to the sample tested.

SAMPLE ID SUMMARY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-33

Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS

Client Sample Id:	Lab Sample Id:
54SB3A	0701158-01
54SB3B	0701158-02
54SB3B	0701158-02RE1
54SB3C	0701158-03
54SB83A	0701188-05
54SB83B	0701188-06
54SB83C	0701188-07
DUP-3	0701188-08
54SB84A	0701188-09
54SB84B	0701188-10
54SB84C	0701188-11
54SB23C	0701199-03
54SB32C	0701199-04
54SB32C	0701199-04RE1
54SB82A	0701199-05
54SB82B	0701199-06
54SB82C	0701199-07
DUP4	0701199-08
EQBK-5	0701199-09

DUPS

DRAFT

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB3A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-01 File ID: data010-0

Sampled: 01/10/07 10:05 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 15:42

Solids: 82.34 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.96	118	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB3B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-02 File ID: data011-0

Sampled: 01/10/07 10:10 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 16:23

Solids: 88.78 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	0.64	2.5	0.051	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	1.1	2.5	0.088	J
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
~~1946-51-0~~	~~4-Amino-2,6-dinitrotoluene~~	~~1~~	~~0.68~~	~~2.5~~	~~0.053~~	~~J~~
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.83	113	57 - 139	

* Values outside of QC limits

use reanalysis result = 0.74 mg/kg
RA
2/12/07

00101

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB3B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-02RE1 File ID: data005-0

Sampled: 01/10/07 10:10 Prepared: 01/16/07 16:32 Analyzed: 01/23/07 11:56

Solids: 88.78 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012353 Calibration: 6L18005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	0.56	2.5	0.051	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	1.1	2.5	0.088	J
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.74	2.5	0.053	J
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.90	116	57 - 139	

* Values outside of QC limits

use only ✓ result
RA
2/12/07

00252

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB3C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-03 File ID: data012-0

Sampled: 01/10/07 10:15 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 17:05

Solids: 87.35 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.81	112	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB83A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-05 File ID: data014-0

Sampled: 01/11/07 10:12 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 18:30

Solids: 88.15 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.74	110	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB83B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-06 File ID: data015-0

Sampled: 01/11/07 10:17 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 19:12

Solids: 82.92 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.91	117	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB83C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-07 File ID: data016-0

Sampled: 01/11/07 10:24 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 19:53

Solids: 81.46 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	3.10	124	57 - 139	

* Values outside of QC limits

00113

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-08 File ID: data017-0

Sampled: 01/11/07 00:00 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 20:35

Solids: 80.99 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	3.11	124	57 - 139	

* Values outside of QC limits

00116

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB84A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-09 File ID: data018-0

Sampled: 01/11/07 09:45 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 21:17

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.71	108	57 - 139	

* Values outside of QC limits

0019

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB84B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-10 File ID: data019-0

Sampled: 01/11/07 09:50 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 21:59

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.86	114	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB84C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-11 File ID: data020-0

Sampled: 01/11/07 09:55 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 22:41

Solids: Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	3.06	122	57 - 139	

* Values outside of QC limits

AR125

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB23C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-03 File ID: data021-0

Sampled: 01/12/07 09:28 Prepared: 01/16/07 16:32 Analyzed: 01/19/07 23:22

Solids: 83.18 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.97	119	57 - 139	

* Values outside of QC limits

00129

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB32C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-04 File ID: data022-0

Sampled: 01/12/07 09:05 Prepared: 01/16/07 16:32 Analyzed: 01/20/07 00:04

Solids: 82.45 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	0.19	2.5	0.051	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	3.14	126	57 - 139	

* Values outside of QC limits

* use re-analysis result at 0.23 mg/kg
RA
2/12/07

00131

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB32C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-04RE1 File ID: data006-0

Sampled: 01/12/07 09:05 Prepared: 01/16/07 16:32 Analyzed: 01/23/07 12:39

Solids: 82.45 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012353 Calibration: 6L18005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	0.23	2.5	0.051	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	3.34	134	57 - 139	

* Values outside of QC limits

use only Result
RA
2/12/07

00255

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB82A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-05 File ID: data023-0

Sampled: 01/12/07 10:05 Prepared: 01/16/07 16:32 Analyzed: 01/20/07 00:46

Solids: 85.21 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	3.31	132	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB82B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-06 File ID: data033-0

Sampled: 01/12/07 10:10 Prepared: 01/16/07 16:34 Analyzed: 01/20/07 07:44

Solids: 81.80 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700435 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.87	115	57 - 139	

* Values outside of QC limits

aa127

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54SB82C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-07 File ID: data025-0

Sampled: 01/12/07 10:15 Prepared: 01/16/07 16:32 Analyzed: 01/20/07 02:10

Solids: 79.89 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	3.44	138	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-08 File ID: data026-0

Sampled: 01/12/07 10:15 Prepared: 01/16/07 16:32 Analyzed: 01/20/07 02:51

Solids: 75.65 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0700434 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.20	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.052	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.051	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.073	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.099	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.088	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.071	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.12	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.053	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.12	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	2.5	2.5	0.089	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	2.5	2.5	0.059	U
98-95-3	Nitrobenzene	1	2.5	2.5	0.089	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5	2.5	0.17	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	3.08	123	57 - 139	

* Values outside of QC limits

00143

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

EQBK-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Water Laboratory ID: 0701199-09 File ID: data032-0

Sampled: 01/12/07 12:15 Prepared: 01/16/07 07:55 Analyzed: 01/20/07 07:02

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0700444 Sequence: 7012237 Calibration: 6L14006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.16	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.23	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.075	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.12	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.27	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.20	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.26	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.22	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.31	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.15	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.16	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.18	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.058	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.25	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	5.84	90	29 - 138	

* Values outside of QC limits

SAMPLE ID SUMMARY

USEPA-8081A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-33
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS

Client Sample Id:	Lab Sample Id:
54SB42A	0701124-01
54SB42B	0701124-02
54SB42C	0701124-03
DUP-1	0701124-04
54SB3A	0701158-01
54SB3B	0701158-02
54SB3C	0701158-03
54SB10A	0701158-04
54SB10B	0701158-05
54SB10C	0701158-06
DUP2	0701158-07
54SB81A	0701158-08
54SB81B	0701158-09
54SB81C	0701158-10
54SB33A	0701158-12
54SB22A	0701188-01
54SB22B	0701188-02
54SB22C	0701188-03
54SB83A	0701188-05
54SB83B	0701188-06
54SB83C	0701188-07
DUP-3	0701188-08
EQBK3	0701188-13
54SB23A	0701199-01
54SB23B	0701199-02
54SB23C	0701199-03
54SB32C	0701199-04
54SB82A	0701199-05
54SB82B	0701199-06
54SB82C	0701199-07
DUP4	0701199-08
EQBK-5	0701199-09

ANALYSIS DATA SHEET

54SB42A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-01 File ID: A47_183-0

Sampled: 01/08/07 16:00 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 08:42

Solids: 82.88 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.42	U
319-85-7	beta-BHC	1	4.0	4.0	0.81	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.77	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.82	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.4	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.2	U
309-00-2	Aldrin	1	2.1	2.1	0.66	U
60-57-1	Dieldrin	1	4.0	4.0	0.56	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.65	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.1	8.1	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.50	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.2	36.1	90	70 - 125	
Decachlorobiphenyl	40.2	37.4	93	55 - 130	

* Values outside of QC limits

AA363

ANALYSIS DATA SHEET

54SB42B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-02 File ID: A47_180-0

Sampled: 01/08/07 16:15 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 06:45

Solids: 83.34 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.42	U
319-85-7	beta-BHC	1	4.0	4.0	0.81	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.77	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.81	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.56	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.3	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.65	U
60-57-1	Dieldrin	1	4.0	4.0	0.55	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.64	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.2	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.0	8.0	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.50	U
72-43-5	Methoxychlor	1	20	20	1.5	U
8001-35-2	Toxaphene	1	200	200	27	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Tetrachloro-m-xylene		40.0	36.7	92	70 - 125	
Decachlorobiphenyl		40.0	37.0	92	55 - 130	

* Values outside of QC limits

00372

ANALYSIS DATA SHEET

54SB42C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-03 File ID: A47_184-0

Sampled: 01/08/07 16:25 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 09:21

Solids: 83.95 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.42	U
319-85-7	beta-BHC	1	3.9	3.9	0.80	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.76	U
319-86-8	delta-BHC	1	3.9	3.9	1.1	U
5103-71-9	alpha-Chlordane	1	3.9	3.9	0.81	U
5103-74-2	gamma-Chlordane	1	3.9	3.9	0.56	U
72-54-8	4,4'-DDD	1	3.9	3.9	1.3	U
72-55-9	4,4'-DDE	1	3.9	3.9	1.1	U
50-29-3	4,4'-DDT	1	3.9	3.9	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.65	U
60-57-1	Dieldrin	1	3.9	3.9	0.55	U
959-98-8	Endosulfan I	1	3.9	3.9	1.1	U
33213-65-9	Endosulfan II	1	3.9	3.9	1.0	U
1031-07-8	Endosulfan Sulfate	1	3.9	3.9	1.2	U
72-20-8	Endrin	1	3.9	3.9	0.64	U
7421-93-4	Endrin Aldehyde	1	3.9	3.9	1.2	U
53494-70-5	Endrin Ketone	1	3.9	3.9	1.2	U
76-44-8	Heptachlor	1	8.0	8.0	1.4	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.49	U
72-43-5	Methoxychlor	1	20	20	1.5	U
8001-35-2	Toxaphene	1	200	200	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	39.7	36.0	91	70 - 125	
Decachlorobiphenyl	39.7	37.5	94	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-04 File ID: A47_181-0

Sampled: 01/08/07 00:00 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 07:24

Solids: 82.28 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.43	U
319-85-7	beta-BHC	1	4.0	4.0	0.82	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.78	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.82	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.4	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.66	U
60-57-1	Dieldrin	1	4.0	4.0	0.56	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.65	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.1	8.1	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.50	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.5	37.1	92	70 - 125	
Decachlorobiphenyl	40.5	39.3	97	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB3A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-01 File ID: A47_193-0

Sampled: 01/10/07 10:05 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 15:00

Solids: 82.34 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.43	U
319-85-7	beta-BHC	1	4.0	4.0	0.82	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.78	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.82	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.4	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.66	U
60-57-1	Dieldrin	1	4.0	4.0	0.56	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.65	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.1	8.1	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.50	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.5	35.9	89	70 - 125	
Decachlorobiphenyl	40.5	37.4	92	55 - 130	

* Values outside of QC limits

00402

ANALYSIS DATA SHEET

54SB3B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-02 File ID: A47_185-0

Sampled: 01/10/07 10:10 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 09:59

Solids: 88.78 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	1.9	1.9	0.40	U
319-85-7	beta-BHC	1	3.7	3.7	0.76	U
58-89-9	gamma-BHC (lindane)	1	1.9	1.9	0.72	U
319-86-8	delta-BHC	1	3.7	3.7	1.1	U
5103-71-9	alpha-Chlordane	1	3.7	3.7	0.76	U
5103-74-2	gamma-Chlordane	1	3.7	3.7	0.53	U
72-54-8	4,4'-DDD	1	3.7	3.7	1.3	U
72-55-9	4,4'-DDE	1	3.7	3.7	1.0	U
50-29-3	4,4'-DDT	1	3.7	3.7	1.2	U
309-00-2	Aldrin	1	1.9	1.9	0.61	U
60-57-1	Dieldrin	1	3.7	3.7	0.52	U
959-98-8	Endosulfan I	1	3.7	3.7	1.0	U
33213-65-9	Endosulfan II	1	3.7	3.7	0.96	U
1031-07-8	Endosulfan Sulfate	1	3.7	3.7	1.1	U
72-20-8	Endrin	1	3.7	3.7	0.60	U
7421-93-4	Endrin Aldehyde	1	3.7	3.7	1.2	U
53494-70-5	Endrin Ketone	1	3.7	3.7	1.1	U
76-44-8	Heptachlor	1	7.5	7.5	1.4	U
1024-57-3	Heptachlor Epoxide	1	1.9	1.9	0.47	U
72-43-5	Methoxychlor	1	19	19	1.5	U
8001-35-2	Toxaphene	1	190	190	25	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	37.5	36.5	97	70 - 125	
Decachlorobiphenyl	37.5	36.5	97	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB3C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-03 File ID: A47_186-0

Sampled: 01/10/07 10:15 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 10:39

Solids: 87.35 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	1.9	1.9	0.40	U
319-85-7	beta-BHC	1	3.8	3.8	0.77	U
58-89-9	gamma-BHC (lindane)	1	1.9	1.9	0.73	U
319-86-8	delta-BHC	1	3.8	3.8	1.1	U
5103-71-9	alpha-Chlordane	1	3.8	3.8	0.78	U
5103-74-2	gamma-Chlordane	1	3.8	3.8	0.54	U
72-54-8	4,4'-DDD	1	3.8	3.8	1.3	U
72-55-9	4,4'-DDE	1	3.8	3.8	1.0	U
50-29-3	4,4'-DDT	1	3.8	3.8	1.2	U
309-00-2	Aldrin	1	1.9	1.9	0.62	U
60-57-1	Dieldrin	1	3.8	3.8	0.53	U
959-98-8	Endosulfan I	1	3.8	3.8	1.0	U
33213-65-9	Endosulfan II	1	3.8	3.8	0.98	U
1031-07-8	Endosulfan Sulfate	1	3.8	3.8	1.1	U
72-20-8	Endrin	1	3.8	3.8	0.61	U
7421-93-4	Endrin Aldehyde	1	3.8	3.8	1.2	U
53494-70-5	Endrin Ketone	1	3.8	3.8	1.2	U
76-44-8	Heptachlor	1	7.7	7.7	1.4	U
1024-57-3	Heptachlor Epoxide	1	1.9	1.9	0.47	U
72-43-5	Methoxychlor	1	19	19	1.5	U
8001-35-2	Toxaphene	1	190	190	26	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	38.2	36.5	96	70 - 125	
Decachlorobiphenyl	38.2	37.3	98	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB10A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-04 File ID: A47_182-0

Sampled: 01/10/07 10:51 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 08:03

Solids: 82.97 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.42	U
319-85-7	beta-BHC	1	4.0	4.0	0.81	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.77	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.82	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.3	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.65	U
60-57-1	Dieldrin	1	4.0	4.0	0.56	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.65	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.1	8.1	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.50	U
72-43-5	Methoxychlor	1	20	20	1.6	U
8001-35-2	Toxaphene	1	200	200	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.2	36.8	92	70 - 125	
Decachlorobiphenyl	40.2	38.0	95	55 - 130	

* Values outside of QC limits

00429

ANALYSIS DATA SHEET

54SB10B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-05 File ID: A47_195-0

Sampled: 01/10/07 10:57 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 16:16

Solids: 79.66 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.44	U
319-85-7	beta-BHC	1	4.1	4.1	0.84	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.81	U
319-86-8	delta-BHC	1	4.1	4.1	1.2	U
5103-71-9	alpha-Chlordane	1	4.1	4.1	0.85	U
5103-74-2	gamma-Chlordane	1	4.1	4.1	0.59	U
72-54-8	4,4'-DDD	1	4.1	4.1	1.4	U
72-55-9	4,4'-DDE	1	4.1	4.1	1.1	U
50-29-3	4,4'-DDT	1	4.1	4.1	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.68	U
60-57-1	Dieldrin	1	4.1	4.1	0.58	U
959-98-8	Endosulfan I	1	4.1	4.1	1.1	U
33213-65-9	Endosulfan II	1	4.1	4.1	1.1	U
1031-07-8	Endosulfan Sulfate	1	4.1	4.1	1.3	U
72-20-8	Endrin	1	4.1	4.1	0.67	U
7421-93-4	Endrin Aldehyde	1	4.1	4.1	1.3	U
53494-70-5	Endrin Ketone	1	4.1	4.1	1.3	U
76-44-8	Heptachlor	1	8.4	8.4	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.52	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	28	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	41.8	41.8	100	70 - 125	
Decachlorobiphenyl	41.8	39.0	93	55 - 130	

* Values outside of QC limits

00438

ANALYSIS DATA SHEET

54SB10C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-06 File ID: A47_196-0

Sampled: 01/10/07 11:04 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 16:55

Solids: 85.83 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.41	U
319-85-7	beta-BHC	1	3.8	3.8	0.78	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.75	U
319-86-8	delta-BHC	1	3.8	3.8	1.1	U
5103-71-9	alpha-Chlordane	1	3.8	3.8	0.79	U
5103-74-2	gamma-Chlordane	1	3.8	3.8	0.55	U
72-54-8	4,4'-DDD	1	3.8	3.8	1.3	U
72-55-9	4,4'-DDE	1	3.8	3.8	1.0	U
50-29-3	4,4'-DDT	1	3.8	3.8	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.63	U
60-57-1	Dieldrin	1	3.8	3.8	0.54	U
959-98-8	Endosulfan I	1	3.8	3.8	1.0	U
33213-65-9	Endosulfan II	1	3.8	3.8	1.0	U
1031-07-8	Endosulfan Sulfate	1	3.8	3.8	1.2	U
72-20-8	Endrin	1	3.8	3.8	0.62	U
7421-93-4	Endrin Aldehyde	1	3.8	3.8	1.2	U
53494-70-5	Endrin Ketone	1	3.8	3.8	1.2	U
76-44-8	Heptachlor	1	7.8	7.8	1.4	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.48	U
72-43-5	Methoxychlor	1	20	20	1.5	U
8001-35-2	Toxaphene	1	200	200	26	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	38.8	36.8	95	70 - 125	
Decachlorobiphenyl	38.8	35.8	92	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

DUP2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-07 File ID: A47_197-0

Sampled: 01/10/07 00:00 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 17:34

Solids: 84.25 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.42	U
319-85-7	beta-BHC	1	3.9	3.9	0.80	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.76	U
319-86-8	delta-BHC	1	3.9	3.9	1.1	U
5103-71-9	alpha-Chlordane	1	3.9	3.9	0.80	U
5103-74-2	gamma-Chlordane	1	3.9	3.9	0.56	U
72-54-8	4,4'-DDD	1	3.9	3.9	1.3	U
72-55-9	4,4'-DDE	1	3.9	3.9	1.1	U
50-29-3	4,4'-DDT	1	3.9	3.9	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.64	U
60-57-1	Dieldrin	1	3.9	3.9	0.55	U
959-98-8	Endosulfan I	1	3.9	3.9	1.1	U
33213-65-9	Endosulfan II	1	3.9	3.9	1.0	U
1031-07-8	Endosulfan Sulfate	1	3.9	3.9	1.2	U
72-20-8	Endrin	1	3.9	3.9	0.64	U
7421-93-4	Endrin Aldehyde	1	3.9	3.9	1.2	U
53494-70-5	Endrin Ketone	1	3.9	3.9	1.2	U
76-44-8	Heptachlor	1	8.0	8.0	1.4	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.49	U
72-43-5	Methoxychlor	1	20	20	1.5	U
8001-35-2	Toxaphene	1	200	200	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	39.6	37.3	94	70 - 125	
Decachlorobiphenyl	39.6	34.9	88	55 - 130	

* Values outside of QC limits

00456

ANALYSIS DATA SHEET

54SB81A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-08 File ID: A47_198-0

Sampled: 01/10/07 13:06 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 18:13

Solids: 86.09 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.41	U
319-85-7	beta-BHC	1	3.8	3.8	0.78	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.75	U
319-86-8	delta-BHC	1	3.8	3.8	1.1	U
5103-71-9	alpha-Chlordane	1	3.8	3.8	0.79	U
5103-74-2	gamma-Chlordane	1	3.8	3.8	0.55	U
72-54-8	4,4'-DDD	1	3.8	3.8	1.3	U
72-55-9	4,4'-DDE	1	3.8	3.8	1.0	U
50-29-3	4,4'-DDT	1	3.8	3.8	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.63	U
60-57-1	Dieldrin	1	3.8	3.8	0.54	U
959-98-8	Endosulfan I	1	3.8	3.8	1.0	U
33213-65-9	Endosulfan II	1	3.8	3.8	0.99	U
1031-07-8	Endosulfan Sulfate	1	3.8	3.8	1.2	U
72-20-8	Endrin	1	3.8	3.8	0.62	U
7421-93-4	Endrin Aldehyde	1	3.8	3.8	1.2	U
53494-70-5	Endrin Ketone	1	3.8	3.8	1.2	U
76-44-8	Heptachlor	1	7.8	7.8	1.4	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.48	U
72-43-5	Methoxychlor	1	20	20	1.5	U
8001-35-2	Toxaphene	1	200	200	26	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Tetrachloro-m-xylene		38.7	37.3	96	70 - 125	
Decachlorobiphenyl		38.7	36.1	93	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB81B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-09 File ID: A47_199-0

Sampled: 01/10/07 13:11 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 18:53

Solids: 85.70 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.41	U
319-85-7	beta-BHC	1	3.9	3.9	0.79	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.75	U
319-86-8	delta-BHC	1	3.9	3.9	1.1	U
5103-71-9	alpha-Chlordane	1	3.9	3.9	0.79	U
5103-74-2	gamma-Chlordane	1	3.9	3.9	0.55	U
72-54-8	4,4'-DDD	1	3.9	3.9	1.3	U
72-55-9	4,4'-DDE	1	3.9	3.9	1.0	U
50-29-3	4,4'-DDT	1	3.9	3.9	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.63	U
60-57-1	Dieldrin	1	3.9	3.9	0.54	U
959-98-8	Endosulfan I	1	3.9	3.9	1.0	U
33213-65-9	Endosulfan II	1	3.9	3.9	1.0	U
1031-07-8	Endosulfan Sulfate	1	3.9	3.9	1.2	U
72-20-8	Endrin	1	3.9	3.9	0.63	U
7421-93-4	Endrin Aldehyde	1	3.9	3.9	1.2	U
53494-70-5	Endrin Ketone	1	3.9	3.9	1.2	U
76-44-8	Heptachlor	1	7.8	7.8	1.4	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.48	U
72-43-5	Methoxychlor	1	20	20	1.5	U
8001-35-2	Toxaphene	1	200	200	26	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	38.9	37.6	97	70 - 125	
Decachlorobiphenyl	38.9	35.5	91	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB81C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-10 File ID: A47_200-0

Sampled: 01/10/07 13:16 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 19:32

Solids: 80.08 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.44	U
319-85-7	beta-BHC	1	4.1	4.1	0.84	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.80	U
319-86-8	delta-BHC	1	4.1	4.1	1.2	U
5103-71-9	alpha-Chlordane	1	4.1	4.1	0.85	U
5103-74-2	gamma-Chlordane	1	4.1	4.1	0.59	U
72-54-8	4,4'-DDD	1	4.1	4.1	1.4	U
72-55-9	4,4'-DDE	1	4.1	4.1	1.1	U
50-29-3	4,4'-DDT	1	4.1	4.1	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.68	U
60-57-1	Dieldrin	1	4.1	4.1	0.58	U
959-98-8	Endosulfan I	1	4.1	4.1	1.1	U
33213-65-9	Endosulfan II	1	4.1	4.1	1.1	U
1031-07-8	Endosulfan Sulfate	1	4.1	4.1	1.2	U
72-20-8	Endrin	1	4.1	4.1	0.67	U
7421-93-4	Endrin Aldehyde	1	4.1	4.1	1.3	U
53494-70-5	Endrin Ketone	1	4.1	4.1	1.3	U
76-44-8	Heptachlor	1	8.4	8.4	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.52	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	28	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Tetrachloro-m-xylene		41.6	42.7	103	70 - 125	
Decachlorobiphenyl		41.6	41.4	99	55 - 130	

* Values outside of QC limits

AALR3

ANALYSIS DATA SHEET

54SB33A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-12 File ID: A47_194-0

Sampled: 01/10/07 14:35 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 15:36

Solids: 81.91 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.43	U
319-85-7	beta-BHC	1	4.0	4.0	0.82	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.78	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.83	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.4	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.66	U
60-57-1	Dieldrin	1	4.0	4.0	0.56	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.65	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.2	8.2	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.51	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.7	38.4	94	70 - 125	
Decachlorobiphenyl	40.7	39.0	96	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB22A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-01 File ID: A47_201-0

Sampled: 01/11/07 15:05 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 20:11

Solids: 83.06 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.42	U
319-85-7	beta-BHC	1	4.0	4.0	0.81	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.77	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.82	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.3	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.65	U
60-57-1	Dieldrin	1	4.0	4.0	0.56	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.65	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.1	8.1	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.50	U
72-43-5	Methoxychlor	1	20	20	1.6	U
8001-35-2	Toxaphene	1	200	200	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.1	38.8	97	70 - 125	
Decachlorobiphenyl	40.1	39.0	97	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB22B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-02 File ID: A47_202-0

Sampled: 01/11/07 15:10 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 20:50

Solids: 81.22 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.43	U
319-85-7	beta-BHC	1	4.1	4.1	0.83	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.79	U
319-86-8	delta-BHC	1	4.1	4.1	1.2	U
5103-71-9	alpha-Chlordane	1	4.1	4.1	0.83	U
5103-74-2	gamma-Chlordane	1	4.1	4.1	0.58	U
72-54-8	4,4'-DDD	1	4.1	4.1	1.4	U
72-55-9	4,4'-DDE	1	4.1	4.1	1.1	U
50-29-3	4,4'-DDT	1	4.1	4.1	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.67	U
60-57-1	Dieldrin	1	4.1	4.1	0.57	U
959-98-8	Endosulfan I	1	4.1	4.1	1.1	U
33213-65-9	Endosulfan II	1	4.1	4.1	1.1	U
1031-07-8	Endosulfan Sulfate	1	4.1	4.1	1.2	U
72-20-8	Endrin	1	4.1	4.1	0.66	U
7421-93-4	Endrin Aldehyde	1	4.1	4.1	1.3	U
53494-70-5	Endrin Ketone	1	4.1	4.1	1.3	U
76-44-8	Heptachlor	1	8.2	8.2	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.51	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	28	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	41.0	40.1	98	70 - 125	
Decachlorobiphenyl	41.0	39.0	95	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB22C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-03 File ID: A47_205-0

Sampled: 01/11/07 15:15 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 22:49

Solids: 79.72 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.44	U
319-85-7	beta-BHC	1	4.1	4.1	0.84	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.81	U
319-86-8	delta-BHC	1	4.1	4.1	1.2	U
5103-71-9	alpha-Chlordane	1	4.1	4.1	0.85	U
5103-74-2	gamma-Chlordane	1	4.1	4.1	0.59	U
72-54-8	4,4'-DDD	1	4.1	4.1	1.4	U
72-55-9	4,4'-DDE	1	4.1	4.1	1.1	U
50-29-3	4,4'-DDT	1	4.1	4.1	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.68	U
60-57-1	Dieldrin	1	4.1	4.1	0.58	U
959-98-8	Endosulfan I	1	4.1	4.1	1.1	U
33213-65-9	Endosulfan II	1	4.1	4.1	1.1	U
1031-07-8	Endosulfan Sulfate	1	4.1	4.1	1.3	U
72-20-8	Endrin	1	4.1	4.1	0.67	U
7421-93-4	Endrin Aldehyde	1	4.1	4.1	1.3	U
53494-70-5	Endrin Ketone	1	4.1	4.1	1.3	U
76-44-8	Heptachlor	1	8.4	8.4	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.52	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	28	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	41.8	40.4	97	70 - 125	
Decachlorobiphenyl	41.8	39.3	94	55 - 130	

* Values outside of QC limits

0519

ANALYSIS DATA SHEET

54SB83A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-05 File ID: A47_206-0

Sampled: 01/11/07 10:12 Prepared: 01/15/07 08:09 Analyzed: 01/19/07 23:29

Solids: 88.15 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	1.9	1.9	0.40	U
319-85-7	beta-BHC	1	3.7	3.7	0.76	U
58-89-9	gamma-BHC (lindane)	1	1.9	1.9	0.73	U
319-86-8	delta-BHC	1	3.7	3.7	1.1	U
5103-71-9	alpha-Chlordane	1	3.7	3.7	0.77	U
5103-74-2	gamma-Chlordane	1	3.7	3.7	0.53	U
72-54-8	4,4'-DDD	1	3.7	3.7	1.3	U
72-55-9	4,4'-DDE	1	3.7	3.7	1.0	U
50-29-3	4,4'-DDT	1	3.7	3.7	1.2	U
309-00-2	Aldrin	1	1.9	1.9	0.62	U
60-57-1	Dieldrin	1	3.7	3.7	0.52	U
959-98-8	Endosulfan I	1	3.7	3.7	1.0	U
33213-65-9	Endosulfan II	1	3.7	3.7	0.97	U
1031-07-8	Endosulfan Sulfate	1	3.7	3.7	1.1	U
72-20-8	Endrin	1	3.7	3.7	0.61	U
7421-93-4	Endrin Aldehyde	1	3.7	3.7	1.2	U
53494-70-5	Endrin Ketone	1	3.7	3.7	1.2	U
76-44-8	Heptachlor	1	7.6	7.6	1.4	U
1024-57-3	Heptachlor Epoxide	1	1.9	1.9	0.47	U
72-43-5	Methoxychlor	1	19	19	1.5	U
8001-35-2	Toxaphene	1	190	190	25	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	37.8	35.2	93	70 - 125	
Decachlorobiphenyl	37.8	35.0	92	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB83B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-06 File ID: A47_207-0

Sampled: 01/11/07 10:17 Prepared: 01/15/07 08:09 Analyzed: 01/20/07 00:08

Solids: 82.92 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700401 Sequence: 7012322 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.42	U
319-85-7	beta-BHC	1	4.0	4.0	0.81	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.77	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.82	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.4	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.2	U
309-00-2	Aldrin	1	2.1	2.1	0.65	U
60-57-1	Dieldrin	1	4.0	4.0	0.56	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.65	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.1	8.1	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.50	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.2	38.5	96	70 - 125	
Decachlorobiphenyl	40.2	36.5	91	55 - 130	

* Values outside of QC limits

00537

ANALYSIS DATA SHEET

54SB83C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-07 File ID: A47_220-0

Sampled: 01/11/07 10:24 Prepared: 01/15/07 12:31 Analyzed: 01/22/07 18:35

Solids: 81.46 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700414 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.43	U
319-85-7	beta-BHC	1	4.1	4.1	0.83	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.79	U
319-86-8	delta-BHC	1	4.1	4.1	1.1	U
5103-71-9	alpha-Chlordane	1	4.1	4.1	0.83	U
5103-74-2	gamma-Chlordane	1	4.1	4.1	0.58	U
72-54-8	4,4'-DDD	1	4.1	4.1	1.4	U
72-55-9	4,4'-DDE	1	4.1	4.1	1.1	U
50-29-3	4,4'-DDT	1	4.1	4.1	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.67	U
60-57-1	Dieldrin	1	4.1	4.1	0.57	U
959-98-8	Endosulfan I	1	4.1	4.1	1.1	U
33213-65-9	Endosulfan II	1	4.1	4.1	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.1	4.1	1.2	U
72-20-8	Endrin	1	4.1	4.1	0.66	U
7421-93-4	Endrin Aldehyde	1	4.1	4.1	1.3	U
53494-70-5	Endrin Ketone	1	4.1	4.1	1.3	U
76-44-8	Heptachlor	1	8.2	8.2	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.51	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.9	39.7	97	70 - 125	
Decachlorobiphenyl	40.9	39.5	97	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

DUP-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-08 File ID: A47_221-0

Sampled: 01/11/07 00:00 Prepared: 01/15/07 12:31 Analyzed: 01/22/07 19:14

Solids: 80.99 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700414 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.43	U
319-85-7	beta-BHC	1	4.1	4.1	0.83	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.79	U
319-86-8	delta-BHC	1	4.1	4.1	1.2	U
5103-71-9	alpha-Chlordane	1	4.1	4.1	0.84	U
5103-74-2	gamma-Chlordane	1	4.1	4.1	0.58	U
72-54-8	4,4'-DDD	1	4.1	4.1	1.4	U
72-55-9	4,4'-DDE	1	4.1	4.1	1.1	U
50-29-3	4,4'-DDT	1	4.1	4.1	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.67	U
60-57-1	Dieldrin	1	4.1	4.1	0.57	U
959-98-8	Endosulfan I	1	4.1	4.1	1.1	U
33213-65-9	Endosulfan II	1	4.1	4.1	1.1	U
1031-07-8	Endosulfan Sulfate	1	4.1	4.1	1.2	U
72-20-8	Endrin	1	4.1	4.1	0.66	U
7421-93-4	Endrin Aldehyde	1	4.1	4.1	1.3	U
53494-70-5	Endrin Ketone	1	4.1	4.1	1.3	U
76-44-8	Heptachlor	1	8.3	8.3	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.51	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	28	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Tetrachloro-m-xylene		41.2	37.7	91	70 - 125	
Decachlorobiphenyl		41.2	36.7	89	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

EQBK3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Water Laboratory ID: 0701188-13 File ID: A47_223-0

Sampled: 01/11/07 14:15 Prepared: 01/15/07 13:16 Analyzed: 01/22/07 20:33

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1050 mL / 2 mL

QC Batch: 0700425 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.190	0.183	96	30 - 135	
Decachlorobiphenyl	0.190	0.140	73	25 - 140	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB23A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-01 File ID: A47_233-0

Sampled: 01/12/07 09:18 Prepared: 01/15/07 12:31 Analyzed: 01/23/07 03:04

Solids: 85.97 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700414 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.41	U
319-85-7	beta-BHC	1	3.8	3.8	0.78	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.75	U
319-86-8	delta-BHC	1	3.8	3.8	1.1	U
5103-71-9	alpha-Chlordane	1	3.8	3.8	0.79	U
5103-74-2	gamma-Chlordane	1	3.8	3.8	0.55	U
72-54-8	4,4'-DDD	1	3.8	3.8	1.3	U
72-55-9	4,4'-DDE	1	3.8	3.8	1.0	U
50-29-3	4,4'-DDT	1	3.8	3.8	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.63	U
60-57-1	Dieldrin	1	3.8	3.8	0.54	U
959-98-8	Endosulfan I	1	3.8	3.8	1.0	U
33213-65-9	Endosulfan II	1	3.8	3.8	0.99	U
1031-07-8	Endosulfan Sulfate	1	3.8	3.8	1.2	U
72-20-8	Endrin	1	3.8	3.8	0.62	U
7421-93-4	Endrin Aldehyde	1	3.8	3.8	1.2	U
53494-70-5	Endrin Ketone	1	3.8	3.8	1.2	U
76-44-8	Heptachlor	1	7.8	7.8	1.4	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.48	U
72-43-5	Methoxychlor	1	20	20	1.5	U
8001-35-2	Toxaphene	1	200	200	26	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	38.8	37.5	97	70 - 125	
Decachlorobiphenyl	38.8	36.6	94	55 - 130	

* Values outside of QC limits

00573

ANALYSIS DATA SHEET

54SB23B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-02 File ID: A47_234-0

Sampled: 01/12/07 09:23 Prepared: 01/15/07 12:31 Analyzed: 01/23/07 03:44

Solids: 82.43 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700414 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.43	U
319-85-7	beta-BHC	1	4.0	4.0	0.82	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.78	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.82	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.4	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.2	U
309-00-2	Aldrin	1	2.1	2.1	0.66	U
60-57-1	Dieldrin	1	4.0	4.0	0.56	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.65	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.1	8.1	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.50	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.4	39.5	98	70 - 125	
Decachlorobiphenyl	40.4	40.4	100	55 - 130	

* Values outside of QC limits

00582

ANALYSIS DATA SHEET

54SB23C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-03 File ID: A47_235-0

Sampled: 01/12/07 09:28 Prepared: 01/15/07 12:31 Analyzed: 01/23/07 04:23

Solids: 83.18 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700414 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.42	U
319-85-7	beta-BHC	1	4.0	4.0	0.81	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.77	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.82	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.3	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.65	U
60-57-1	Dieldrin	1	4.0	4.0	0.55	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.64	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.1	8.1	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.50	U
72-43-5	Methoxychlor	1	20	20	1.6	U
8001-35-2	Toxaphene	1	200	200	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.1	39.1	98	70 - 125	
Decachlorobiphenyl	40.1	38.7	97	55 - 130	

* Values outside of QC limits

00591

ANALYSIS DATA SHEET

54SB32C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-04 File ID: A47_236-0

Sampled: 01/12/07 09:05 Prepared: 01/15/07 12:31 Analyzed: 01/23/07 05:02

Solids: 82.45 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700414 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.43	U
319-85-7	beta-BHC	1	4.0	4.0	0.82	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.78	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.82	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.4	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.2	U
309-00-2	Aldrin	1	2.1	2.1	0.66	U
60-57-1	Dieldrin	1	4.0	4.0	0.56	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.65	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.1	8.1	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.50	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.4	40.8	101	70 - 125	
Decachlorobiphenyl	40.4	39.6	98	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB82A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-05 File ID: A47_237-0

Sampled: 01/12/07 10:05 Prepared: 01/15/07 12:31 Analyzed: 01/23/07 05:41

Solids: 85.21 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700414 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.0	2.0	0.41	U
319-85-7	beta-BHC	1	3.9	3.9	0.79	U
58-89-9	gamma-BHC (lindane)	1	2.0	2.0	0.75	U
319-86-8	delta-BHC	1	3.9	3.9	1.1	U
5103-71-9	alpha-Chlordane	1	3.9	3.9	0.80	U
5103-74-2	gamma-Chlordane	1	3.9	3.9	0.55	U
72-54-8	4,4'-DDD	1	3.9	3.9	1.3	U
72-55-9	4,4'-DDE	1	3.9	3.9	1.1	U
50-29-3	4,4'-DDT	1	3.9	3.9	1.2	U
309-00-2	Aldrin	1	2.0	2.0	0.64	U
60-57-1	Dieldrin	1	3.9	3.9	0.54	U
959-98-8	Endosulfan I	1	3.9	3.9	1.1	U
33213-65-9	Endosulfan II	1	3.9	3.9	1.0	U
1031-07-8	Endosulfan Sulfate	1	3.9	3.9	1.2	U
72-20-8	Endrin	1	3.9	3.9	0.63	U
7421-93-4	Endrin Aldehyde	1	3.9	3.9	1.2	U
53494-70-5	Endrin Ketone	1	3.9	3.9	1.2	U
76-44-8	Heptachlor	1	7.9	7.9	1.4	U
1024-57-3	Heptachlor Epoxide	1	2.0	2.0	0.49	U
72-43-5	Methoxychlor	1	20	20	1.5	U
8001-35-2	Toxaphene	1	200	200	26	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Tetrachloro-m-xylene		39.1	38.6	99	70 - 125	
Decachlorobiphenyl		39.1	37.9	97	55 - 130	

* Values outside of QC limits

00609

ANALYSIS DATA SHEET

54SB82B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-06 File ID: A47_238-0

Sampled: 01/12/07 10:10 Prepared: 01/15/07 12:31 Analyzed: 01/23/07 06:20

Solids: 81.80 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700414 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.43	U
319-85-7	beta-BHC	1	4.0	4.0	0.82	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.78	U
319-86-8	delta-BHC	1	4.0	4.0	1.1	U
5103-71-9	alpha-Chlordane	1	4.0	4.0	0.83	U
5103-74-2	gamma-Chlordane	1	4.0	4.0	0.57	U
72-54-8	4,4'-DDD	1	4.0	4.0	1.4	U
72-55-9	4,4'-DDE	1	4.0	4.0	1.1	U
50-29-3	4,4'-DDT	1	4.0	4.0	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.66	U
60-57-1	Dieldrin	1	4.0	4.0	0.56	U
959-98-8	Endosulfan I	1	4.0	4.0	1.1	U
33213-65-9	Endosulfan II	1	4.0	4.0	1.0	U
1031-07-8	Endosulfan Sulfate	1	4.0	4.0	1.2	U
72-20-8	Endrin	1	4.0	4.0	0.66	U
7421-93-4	Endrin Aldehyde	1	4.0	4.0	1.3	U
53494-70-5	Endrin Ketone	1	4.0	4.0	1.2	U
76-44-8	Heptachlor	1	8.2	8.2	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.51	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	27	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	40.7	39.0	96	70 - 125	
Decachlorobiphenyl	40.7	38.8	95	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB82C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-07 File ID: A47_239-0

Sampled: 01/12/07 10:15 Prepared: 01/15/07 12:31 Analyzed: 01/23/07 06:59

Solids: 79.89 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700414 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.1	2.1	0.44	U
319-85-7	beta-BHC	1	4.1	4.1	0.84	U
58-89-9	gamma-BHC (lindane)	1	2.1	2.1	0.80	U
319-86-8	delta-BHC	1	4.1	4.1	1.2	U
5103-71-9	alpha-Chlordane	1	4.1	4.1	0.85	U
5103-74-2	gamma-Chlordane	1	4.1	4.1	0.59	U
72-54-8	4,4'-DDD	1	4.1	4.1	1.4	U
72-55-9	4,4'-DDE	1	4.1	4.1	1.1	U
50-29-3	4,4'-DDT	1	4.1	4.1	1.3	U
309-00-2	Aldrin	1	2.1	2.1	0.68	U
60-57-1	Dieldrin	1	4.1	4.1	0.58	U
959-98-8	Endosulfan I	1	4.1	4.1	1.1	U
33213-65-9	Endosulfan II	1	4.1	4.1	1.1	U
1031-07-8	Endosulfan Sulfate	1	4.1	4.1	1.3	U
72-20-8	Endrin	1	4.1	4.1	0.67	U
7421-93-4	Endrin Aldehyde	1	4.1	4.1	1.3	U
53494-70-5	Endrin Ketone	1	4.1	4.1	1.3	U
76-44-8	Heptachlor	1	8.4	8.4	1.5	U
1024-57-3	Heptachlor Epoxide	1	2.1	2.1	0.52	U
72-43-5	Methoxychlor	1	21	21	1.6	U
8001-35-2	Toxaphene	1	210	210	28	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	41.7	41.4	99	70 - 125	
Decachlorobiphenyl	41.7	39.6	95	55 - 130	

* Values outside of QC limits

ANALYSIS DATA SHEET

DUP4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-08 File ID: A47_240-0

Sampled: 01/12/07 10:15 Prepared: 01/15/07 12:31 Analyzed: 01/23/07 07:39

Solids: 75.65 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700414 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
319-84-6	alpha-BHC	1	2.2	2.2	0.46	U
319-85-7	beta-BHC	1	4.4	4.4	0.89	U
58-89-9	gamma-BHC (lindane)	1	2.2	2.2	0.85	U
319-86-8	delta-BHC	1	4.4	4.4	1.2	U
5103-71-9	alpha-Chlordane	1	4.4	4.4	0.90	U
5103-74-2	gamma-Chlordane	1	4.4	4.4	0.62	U
72-54-8	4,4'-DDD	1	4.4	4.4	1.5	U
72-55-9	4,4'-DDE	1	4.4	4.4	1.2	U
50-29-3	4,4'-DDT	1	4.4	4.4	1.4	U
309-00-2	Aldrin	1	2.2	2.2	0.72	U
60-57-1	Dieldrin	1	4.4	4.4	0.61	U
959-98-8	Endosulfan I	1	4.4	4.4	1.2	U
33213-65-9	Endosulfan II	1	4.4	4.4	1.1	U
1031-07-8	Endosulfan Sulfate	1	4.4	4.4	1.3	U
72-20-8	Endrin	1	4.4	4.4	0.71	U
7421-93-4	Endrin Aldehyde	1	4.4	4.4	1.4	U
53494-70-5	Endrin Ketone	1	4.4	4.4	1.3	U
76-44-8	Heptachlor	1	8.9	8.9	1.6	U
1024-57-3	Heptachlor Epoxide	1	2.2	2.2	0.55	U
72-43-5	Methoxychlor	1	22	22	1.7	U
8001-35-2	Toxaphene	1	220	220	30	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	44.1	43.0	98	70 - 125	
Decachlorobiphenyl	44.1	41.7	95	55 - 130	

* Values outside of QC limits

00636

ANALYSIS DATA SHEET

EQBK-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Water Laboratory ID: 0701199-09 File ID: A47_222-0

Sampled: 01/12/07 12:15 Prepared: 01/15/07 13:16 Analyzed: 01/22/07 19:53

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1030 mL / 2 mL

QC Batch: 0700425 Sequence: 7012505 Calibration: 7A23003 Instrument: 199

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
319-84-6	alpha-BHC	1	0.050	0.050	0.0034	U
319-85-7	beta-BHC	1	0.050	0.050	0.0030	U
58-89-9	gamma-BHC (lindane)	1	0.050	0.050	0.0026	U
319-86-8	delta-BHC	1	0.10	0.10	0.0031	U
5103-71-9	alpha-Chlordane	1	0.050	0.050	0.0033	U
5103-74-2	gamma-Chlordane	1	0.050	0.050	0.0034	U
72-54-8	4,4'-DDD	1	0.10	0.10	0.0036	U
72-55-9	4,4'-DDE	1	0.10	0.10	0.0036	U
50-29-3	4,4'-DDT	1	0.10	0.10	0.0036	U
309-00-2	Aldrin	1	0.050	0.050	0.0027	U
60-57-1	Dieldrin	1	0.050	0.050	0.0032	U
959-98-8	Endosulfan I	1	0.10	0.10	0.0028	U
33213-65-9	Endosulfan II	1	0.10	0.10	0.0031	U
1031-07-8	Endosulfan Sulfate	1	0.10	0.10	0.0041	U
72-20-8	Endrin	1	0.10	0.10	0.0029	U
7421-93-4	Endrin Aldehyde	1	0.10	0.10	0.0037	U
53494-70-5	Endrin Ketone	1	0.050	0.050	0.0045	U
76-44-8	Heptachlor	1	0.050	0.050	0.0030	U
1024-57-3	Heptachlor Epoxide	1	0.050	0.050	0.0031	U
72-43-5	Methoxychlor	1	0.50	0.50	0.0036	U
8001-35-2	Toxaphene	1	5.0	5.0	0.10	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Tetrachloro-m-xylene	0.194	0.179	92	30 - 135	
Decachlorobiphenyl	0.194	0.174	90	25 - 140	

* Values outside of QC limits

SAMPLE ID SUMMARY

USEPA-8082

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-33
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS

Client Sample Id:	Lab Sample Id:
54SB42A	0701124-01
54SB42B	0701124-02
54SB42C	0701124-03
DUP-1	0701124-04
54SB46A	0701124-05
54SB46A	0701124-05RE1
54SB46C	0701124-06
54SB46C	0701124-06RE1
54SB3A	0701158-01
54SB3B	0701158-02
54SB3C	0701158-03
54SB10A	0701158-04
54SB10B	0701158-05
54SB10C	0701158-06
DUP2	0701158-07
54SB81A	0701158-08
54SB81B	0701158-09
54SB81C	0701158-10
54SB33A	0701158-12
54SB22A	0701188-01
54SB22B	0701188-02
54SB22C	0701188-03
54SB57A	0701188-04
54SB83A	0701188-05
54SB83B	0701188-06
54SB83C	0701188-07
DUP-3	0701188-08
EQBK3	0701188-13
54SB23A	0701199-01
54SB23B	0701199-02
54SB23C	0701199-03
54SB32C	0701199-04
54SB82A	0701199-05
54SB82B	0701199-06
54SB82C	0701199-07
DUP4	0701199-08
EQBK-5	0701199-09

00989

ANALYSIS DATA SHEET

54SB42A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-01 File ID: A175462-0

Sampled: 01/08/07 16:00 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 19:59

Solids: 82.88 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	81	81	15	U
11141-16-5	PCB-1232	1	40	40	5.4	U
53469-21-9	PCB-1242	1	40	40	7.5	U
12672-29-6	PCB-1248	1	40	40	4.5	U
11097-69-1	PCB-1254	1	40	40	7.2	J
11096-82-5	PCB-1260	1	29	40	5.3	J

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Decachlorobiphenyl	40.2	36.7	91	60 - 125	
Tetrachloro-m-xylene	40.2	35.4	88	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB42B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-02 File ID: A175463-0

Sampled: 01/08/07 16:15 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 20:17

Solids: 83.34 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	80	80	15	U
11141-16-5	PCB-1232	1	40	40	5.4	U
53469-21-9	PCB-1242	1	40	40	7.4	U
12672-29-6	PCB-1248	1	40	40	4.4	U
11097-69-1	PCB-1254	1	140	40	7.2	
11096-82-5	PCB-1260	1	140	40	5.3	
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.0	37.6	94	60 - 125	
Tetrachloro-m-xylene		40.0	36.6	91	32 - 129	

* Values outside of QC limits

01035

ANALYSIS DATA SHEET

54SB42C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-03 File ID: A175464-0

Sampled: 01/08/07 16:25 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 20:35

Solids: 83.95 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	39	39	5.1	U
11104-28-2	PCB-1221	1	80	80	14	U
11141-16-5	PCB-1232	1	39	39	5.4	U
53469-21-9	PCB-1242	1	39	39	7.4	U
12672-29-6	PCB-1248	1	39	39	4.4	U
11097-69-1	PCB-1254	1	39	39	7.1	U
11096-82-5	PCB-1260	1	39	39	5.2	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		39.7	39.7	100	60 - 125	
Tetrachloro-m-xylene		39.7	36.0	91	32 - 129	

* Values outside of QC limits

01048

ANALYSIS DATA SHEET

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-04 File ID: A175465-0

Sampled: 01/08/07 00:00 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 20:53

Solids: 82.28 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	81	81	15	U
11141-16-5	PCB-1232	1	40	40	5.5	U
53469-21-9	PCB-1242	1	40	40	7.5	U
12672-29-6	PCB-1248	1	40	40	4.5	U
11097-69-1	PCB-1254	1	37	40	7.3	J
11096-82-5	PCB-1260	1	19	40	5.3	J
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.5	37.6	93	60 - 125	
Tetrachloro-m-xylene		40.5	36.0	89	32 - 129	

* Values outside of QC limits

01057

ANALYSIS DATA SHEET

54SB46A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-05 File ID: A175488-0

Sampled: 01/09/07 10:30 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 03:42

Solids: 81.79 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.3	U
11104-28-2	PCB-1221	1	82	82	15	U
11141-16-5	PCB-1232	1	40	40	5.5	U
53469-21-9	PCB-1242	1	40	40	7.6	U
12672-29-6	PCB-1248	1	40	40	4.5	U
~~11097-69-1~~	~~PCB-1254~~	~~1~~	~~2000~~	~~40~~	~~7.3~~	~~E~~
11096-82-5	PCB-1260	1	380	40	5.4	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Decachlorobiphenyl	40.8	36.5	90	60 - 125	
Tetrachloro-m-xylene	40.8	36.6	90	32 - 129	

* Values outside of QC limits

01070

ANALYSIS DATA SHEET

54SB46A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-05RE1 File ID: A175509-0

Sampled: 01/09/07 10:30 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 09:56

Solids: 81.79 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	10	400	400	53	U
11104-28-2	PCB-1221	10	820	820	150	U
11141-16-5	PCB-1232	10	400	400	55	U
53469-21-9	PCB-1242	10	400	400	76	U
12672-29-6	PCB-1248	10	400	400	45	U
11097-69-1	PCB-1254	10	2800	400	73	
11096-82-5	PCB-1260	10	470	400	54	
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.8	42.0	103	60 - 125	
Tetrachloro-m-xylene		40.8	38.3	94	32 - 129	

* Values outside of QC limits

use only Result.
RA
2/12/07

01083

ANALYSIS DATA SHEET

54SB46C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-06 File ID: A175489-0

Sampled: 01/09/07 10:45 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 04:00

Solids: 80.25 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	41	41	5.4	U
11104-28-2	PCB-1221	1	83	83	15	U
11141-16-5	PCB-1232	1	41	41	5.6	U
53469-21-9	PCB-1242	1	41	41	7.7	U
12672-29-6	PCB-1248	1	41	41	4.6	U
~~11097-69-1~~	~~PCB-1254~~ Use DF=10	1	2000	41	7.5	~~E~~ J
11096-82-5	PCB-1260 RA 2/12/09	1	510	41	5.5	J

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% Rec.	QC Limits	Q
Decachlorobiphenyl	41.5	37.2	90	60 - 125	
Tetrachloro-m-xylene	41.5	37.5	90	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB46C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701124-06RE1 File ID: A175510-0

Sampled: 01/09/07 10:45 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 10:14

Solids: 80.25 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	10	410	410	54	U
11104-28-2	PCB-1221	10	830	830	150	U
11141-16-5	PCB-1232	10	410	410	56	U
53469-21-9	PCB-1242	10	410	410	77	U
12672-29-6	PCB-1248	10	410	410	46	U
11097-69-1	PCB-1254	10	2600	410	75	
11096-82-5	PCB-1260	10	640	410	55	
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		41.5	43.2	104	60 - 125	
Tetrachloro-m-xylene		41.5	40.7	98	32 - 129	

* Values outside of QC limits

Use only Result. RA
2/12/07

01169

ANALYSIS DATA SHEET

54SB3A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-01 File ID: A175466-0

Sampled: 01/10/07 10:05 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 21:10

Solids: 82.34 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	81	81	15	U
11141-16-5	PCB-1232	1	40	40	5.5	U
53469-21-9	PCB-1242	1	40	40	7.5	U
12672-29-6	PCB-1248	1	40	40	4.5	U
11097-69-1	PCB-1254	1	28	40	7.3	J
11096-82-5	PCB-1260	1	78	40	5.3	
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.5	35.4	87	60 - 125	
Tetrachloro-m-xylene		40.5	35.3	87	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB3B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-02 File ID: A175467-0

Sampled: 01/10/07 10:10 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 21:28

Solids: 88.78 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	37	37	4.8	U
11104-28-2	PCB-1221	1	75	75	14	U
11141-16-5	PCB-1232	1	37	37	5.1	U
53469-21-9	PCB-1242	1	37	37	7.0	U
12672-29-6	PCB-1248	1	37	37	4.2	U
11097-69-1	PCB-1254	1	37	37	6.8	U
11096-82-5	PCB-1260	1	37	37	5.0	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		37.5	34.5	92	60 - 125	
Tetrachloro-m-xylene		37.5	33.8	90	32 - 129	

* Values outside of QC limits

01135

ANALYSIS DATA SHEET

54SB3C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-03 File ID: A175468-0

Sampled: 01/10/07 10:15 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 21:46

Solids: 87.35 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	38	38	4.9	U
11104-28-2	PCB-1221	1	77	77	14	U
11141-16-5	PCB-1232	1	38	38	5.2	U
53469-21-9	PCB-1242	1	38	38	7.1	U
12672-29-6	PCB-1248	1	38	38	4.2	U
11097-69-1	PCB-1254	1	38	38	6.9	U
11096-82-5	PCB-1260	1	38	38	5.0	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		38.2	35.4	93	60 - 125	
Tetrachloro-m-xylene		38.2	34.5	90	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB10A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-04 File ID: A175469-0

Sampled: 01/10/07 10:51 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 22:04

Solids: 82.97 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	81	81	15	U
11141-16-5	PCB-1232	1	40	40	5.4	U
53469-21-9	PCB-1242	1	40	40	7.5	U
12672-29-6	PCB-1248	1	40	40	4.5	U
11097-69-1	PCB-1254	1	40	40	7.2	U
11096-82-5	PCB-1260	1	40	40	5.3	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.2	37.5	93	60 - 125	
Tetrachloro-m-xylene		40.2	36.6	91	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB10B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-05 File ID: A175471-0

Sampled: 01/10/07 10:57 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 22:40

Solids: 79.66 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	41	41	5.4	U
11104-28-2	PCB-1221	1	84	84	15	U
11141-16-5	PCB-1232	1	41	41	5.6	U
53469-21-9	PCB-1242	1	41	41	7.8	U
12672-29-6	PCB-1248	1	41	41	4.6	U
11097-69-1	PCB-1254	1	41	41	7.5	U
11096-82-5	PCB-1260	1	41	41	5.5	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		41.8	39.1	93	60 - 125	
Tetrachloro-m-xylene		41.8	38.0	91	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB10C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-06 File ID: A175472-0

Sampled: 01/10/07 11:04 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 22:57

Solids: 85.83 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	38	38	5.0	U
11104-28-2	PCB-1221	1	78	78	14	U
11141-16-5	PCB-1232	1	38	38	5.2	U
53469-21-9	PCB-1242	1	38	38	7.2	U
12672-29-6	PCB-1248	1	38	38	4.3	U
11097-69-1	PCB-1254	1	38	38	7.0	U
11096-82-5	PCB-1260	1	38	38	5.1	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		38.8	35.5	91	60 - 125	
Tetrachloro-m-xylene		38.8	34.7	89	32 - 129	

* Values outside of QC limits

01171

ANALYSIS DATA SHEET

DUP2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-07 File ID: A175473-0

Sampled: 01/10/07 00:00 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 23:15

Solids: 84.25 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	39	39	5.1	U
11104-28-2	PCB-1221	1	80	80	14	U
11141-16-5	PCB-1232	1	39	39	5.3	U
53469-21-9	PCB-1242	1	39	39	7.4	U
12672-29-6	PCB-1248	1	39	39	4.4	U
11097-69-1	PCB-1254	1	39	39	7.1	U
11096-82-5	PCB-1260	1	39	39	5.2	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		39.6	36.0	91	60 - 125	
Tetrachloro-m-xylene		39.6	35.7	90	32 - 129	

* Values outside of QC limits

01180

ANALYSIS DATA SHEET

54SB81A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-08 File ID: A175474-0

Sampled: 01/10/07 13:06 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 23:33

Solids: 86.09 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	38	38	5.0	U
11104-28-2	PCB-1221	1	78	78	14	U
11141-16-5	PCB-1232	1	38	38	5.2	U
53469-21-9	PCB-1242	1	38	38	7.2	U
12672-29-6	PCB-1248	1	38	38	4.3	U
11097-69-1	PCB-1254	1	38	38	7.0	U
11096-82-5	PCB-1260	1	38	38	5.1	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		38.7	35.5	92	60 - 125	
Tetrachloro-m-xylene		38.7	35.0	90	32 - 129	

* Values outside of QC limits

01189

ANALYSIS DATA SHEET

54SB81B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-09 File ID: A175475-0

Sampled: 01/10/07 13:11 Prepared: 01/15/07 08:11 Analyzed: 01/18/07 23:51

Solids: 85.70 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	39	39	5.0	U
11104-28-2	PCB-1221	1	78	78	14	U
11141-16-5	PCB-1232	1	39	39	5.3	U
53469-21-9	PCB-1242	1	39	39	7.2	U
12672-29-6	PCB-1248	1	39	39	4.3	U
11097-69-1	PCB-1254	1	39	39	7.0	U
11096-82-5	PCB-1260	1	39	39	5.1	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		38.9	35.6	91	60 - 125	
Tetrachloro-m-xylene		38.9	35.3	91	32 - 129	

* Values outside of QC limits

01198

ANALYSIS DATA SHEET

54SB81C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-10 File ID: A175476-0

Sampled: 01/10/07 13:16 Prepared: 01/15/07 08:11 Analyzed: 01/19/07 00:09

Solids: 80.08 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	41	41	5.4	U
11104-28-2	PCB-1221	1	84	84	15	U
11141-16-5	PCB-1232	1	41	41	5.6	U
53469-21-9	PCB-1242	1	41	41	7.7	U
12672-29-6	PCB-1248	1	41	41	4.6	U
11097-69-1	PCB-1254	1	41	41	7.5	U
11096-82-5	PCB-1260	1	41	41	5.5	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		41.6	44.3	106	60 - 125	
Tetrachloro-m-xylene		41.6	42.7	102	32 - 129	

* Values outside of QC limits

A1307

ANALYSIS DATA SHEET

54SB33A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701158-12 File ID: A175477-0

Sampled: 01/10/07 14:35 Prepared: 01/15/07 08:11 Analyzed: 01/19/07 00:26

Solids: 81.91 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	82	82	15	U
11141-16-5	PCB-1232	1	40	40	5.5	U
53469-21-9	PCB-1242	1	40	40	7.6	U
12672-29-6	PCB-1248	1	40	40	4.5	U
11096-82-5	PCB-1260	1	40	40	5.4	U
11097-69-1	PCB-1254	1	65	40	7.3	
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.7	39.1	96	60 - 125	
Tetrachloro-m-xylene		40.7	38.7	95	32 - 129	

* Values outside of QC limits

01216

ANALYSIS DATA SHEET

54SB22A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-01 File ID: A175478-0

Sampled: 01/11/07 15:05 Prepared: 01/15/07 08:11 Analyzed: 01/19/07 00:44

Solids: 83.06 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	81	81	15	U
11141-16-5	PCB-1232	1	40	40	5.4	U
53469-21-9	PCB-1242	1	40	40	7.5	U
12672-29-6	PCB-1248	1	40	40	4.5	U
11097-69-1	PCB-1254	1	40	40	7.2	U
11096-82-5	PCB-1260	1	40	40	5.3	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.1	38.2	95	60 - 125	
Tetrachloro-m-xylene		40.1	37.3	93	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB22B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-02 File ID: A175479-0

Sampled: 01/11/07 15:10 Prepared: 01/15/07 08:11 Analyzed: 01/19/07 01:02

Solids: 81.22 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	41	41	5.3	U
11104-28-2	PCB-1221	1	82	82	15	U
11141-16-5	PCB-1232	1	41	41	5.5	U
53469-21-9	PCB-1242	1	41	41	7.6	U
12672-29-6	PCB-1248	1	41	41	4.6	U
11097-69-1	PCB-1254	1	41	41	7.4	U
11096-82-5	PCB-1260	1	41	41	5.4	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		41.0	38.7	94	60 - 125	
Tetrachloro-m-xylene		41.0	38.0	93	32 - 129	

* Values outside of QC limits

01234

ANALYSIS DATA SHEET

54SB22C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-03 File ID: A175480-0

Sampled: 01/11/07 15:15 Prepared: 01/15/07 08:11 Analyzed: 01/19/07 01:20

Solids: 79.72 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	41	41	5.4	U
11104-28-2	PCB-1221	1	84	84	15	U
11141-16-5	PCB-1232	1	41	41	5.6	U
53469-21-9	PCB-1242	1	41	41	7.8	U
12672-29-6	PCB-1248	1	41	41	4.6	U
11097-69-1	PCB-1254	1	41	41	7.5	U
11096-82-5	PCB-1260	1	41	41	5.5	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		41.8	39.7	95	60 - 125	
Tetrachloro-m-xylene		41.8	38.2	91	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB57A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-04 File ID: A175490-0

Sampled: 01/11/07 12:10 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 04:18

Solids: 85.73 Preparation: 3550B Sonication Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	38	38	5.0	U
11104-28-2	PCB-1221	1	78	78	14	U
11141-16-5	PCB-1232	1	38	38	5.2	U
53469-21-9	PCB-1242	1	38	38	7.2	U
12672-29-6	PCB-1248	1	38	38	4.3	U
11097-69-1	PCB-1254	1	200	38	7.0	
11096-82-5	PCB-1260	1	38	38	5.1	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		38.9	47.4	122	60 - 125	
Tetrachloro-m-xylene		38.9	35.7	92	32 - 129	

* Values outside of QC limits

01252

ANALYSIS DATA SHEET

54SB83A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-05 File ID: A175482-0

Sampled: 01/11/07 10:12 Prepared: 01/15/07 08:11 Analyzed: 01/19/07 01:55

Solids: 88.15 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	37	37	4.9	U
11104-28-2	PCB-1221	1	76	76	14	U
11141-16-5	PCB-1232	1	37	37	5.1	U
53469-21-9	PCB-1242	1	37	37	7.0	U
12672-29-6	PCB-1248	1	37	37	4.2	U
11097-69-1	PCB-1254	1	37	37	6.8	U
11096-82-5	PCB-1260	1	37	37	5.0	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		37.8	34.9	92	60 - 125	
Tetrachloro-m-xylene		37.8	33.5	89	32 - 129	

* Values outside of QC limits

01261

ANALYSIS DATA SHEET

54SB83B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-06 File ID: A175483-0

Sampled: 01/11/07 10:17 Prepared: 01/15/07 08:11 Analyzed: 01/19/07 02:13

Solids: 82.92 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700402 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	81	81	15	U
11141-16-5	PCB-1232	1	40	40	5.4	U
53469-21-9	PCB-1242	1	40	40	7.5	U
12672-29-6	PCB-1248	1	40	40	4.5	U
11097-69-1	PCB-1254	1	40	40	7.2	U
11096-82-5	PCB-1260	1	40	40	5.3	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.2	38.9	97	60 - 125	
Tetrachloro-m-xylene		40.2	37.0	92	32 - 129	

* Values outside of QC limits

01270

ANALYSIS DATA SHEET

54SB83C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-07 File ID: A175491-0

Sampled: 01/11/07 10:24 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 04:36

Solids: 81.46 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	41	41	5.3	U
11104-28-2	PCB-1221	1	82	82	15	U
11141-16-5	PCB-1232	1	41	41	5.5	U
53469-21-9	PCB-1242	1	41	41	7.6	U
12672-29-6	PCB-1248	1	41	41	4.5	U
11097-69-1	PCB-1254	1	41	41	7.4	U
11096-82-5	PCB-1260	1	41	41	5.4	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.9	39.7	97	60 - 125	
Tetrachloro-m-xylene		40.9	38.5	94	32 - 129	

* Values outside of QC limits

01279

ANALYSIS DATA SHEET

DUP-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701188-08 File ID: A175493-0

Sampled: 01/11/07 00:00 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 05:11

Solids: 80.99 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	41	41	5.3	U
11104-28-2	PCB-1221	1	83	83	15	U
11141-16-5	PCB-1232	1	41	41	5.6	U
53469-21-9	PCB-1242	1	41	41	7.7	U
12672-29-6	PCB-1248	1	41	41	4.6	U
11097-69-1	PCB-1254	1	41	41	7.4	U
11096-82-5	PCB-1260	1	41	41	5.4	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		41.2	39.9	97	60 - 125	
Tetrachloro-m-xylene		41.2	38.4	93	32 - 129	

* Values outside of QC limits

01288

ANALYSIS DATA SHEET

EQBK3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Water Laboratory ID: 0701188-13 File ID: A175507-0

Sampled: 01/11/07 14:15 Prepared: 01/15/07 13:16 Analyzed: 01/19/07 09:21

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 1050 mL / 2 mL

QC Batch: 0700424 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% Rec.	QC Limits	Q
Decachlorobiphenyl	0.190	0.142	75	40 - 135	
Tetrachloro-m-xylene	0.190	0.179	94	36 - 114	

* Values outside of QC limits

01297

ANALYSIS DATA SHEET

54SB23A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-01 File ID: A175494-0

Sampled: 01/12/07 09:18 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 05:29

Solids: 85.97 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	38	38	5.0	U
11104-28-2	PCB-1221	1	78	78	14	U
11141-16-5	PCB-1232	1	38	38	5.2	U
53469-21-9	PCB-1242	1	38	38	7.2	U
12672-29-6	PCB-1248	1	38	38	4.3	U
11097-69-1	PCB-1254	1	38	38	7.0	U
11096-82-5	PCB-1260	1	38	38	5.1	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		38.8	40.2	104	60 - 125	
Tetrachloro-m-xylene		38.8	38.3	99	32 - 129	

* Values outside of QC limits

01306

ANALYSIS DATA SHEET

54SB23B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-02 File ID: A175495-0

Sampled: 01/12/07 09:23 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 05:47

Solids: 82.43 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	81	81	15	U
11141-16-5	PCB-1232	1	40	40	5.5	U
53469-21-9	PCB-1242	1	40	40	7.5	U
12672-29-6	PCB-1248	1	40	40	4.5	U
11097-69-1	PCB-1254	1	40	40	7.3	U
11096-82-5	PCB-1260	1	40	40	5.3	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.4	39.4	97	60 - 125	
Tetrachloro-m-xylene		40.4	37.0	92	32 - 129	

* Values outside of QC limits

01315

ANALYSIS DATA SHEET

54SB23C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-03 File ID: A175496-0

Sampled: 01/12/07 09:28 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 06:05

Solids: 83.18 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	81	81	15	U
11141-16-5	PCB-1232	1	40	40	5.4	U
53469-21-9	PCB-1242	1	40	40	7.5	U
12672-29-6	PCB-1248	1	40	40	4.4	U
11097-69-1	PCB-1254	1	40	40	7.2	U
11096-82-5	PCB-1260	1	40	40	5.3	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.1	40.1	100	60 - 125	
Tetrachloro-m-xylene		40.1	38.1	95	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB32C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-04 File ID: A175497-0

Sampled: 01/12/07 09:05 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 06:23

Solids: 82.45 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.2	U
11104-28-2	PCB-1221	1	81	81	15	U
11141-16-5	PCB-1232	1	40	40	5.5	U
53469-21-9	PCB-1242	1	40	40	7.5	U
12672-29-6	PCB-1248	1	40	40	4.5	U
11097-69-1	PCB-1254	1	40	40	7.3	U
11096-82-5	PCB-1260	1	40	40	5.3	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.4	40.9	101	60 - 125	
Tetrachloro-m-xylene		40.4	38.6	96	32 - 129	

* Values outside of QC limits

01333

ANALYSIS DATA SHEET

54SB82A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-05 File ID: A175498-0

Sampled: 01/12/07 10:05 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 06:40

Solids: 85.21 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	39	39	5.0	U
11104-28-2	PCB-1221	1	79	79	14	U
11141-16-5	PCB-1232	1	39	39	5.3	U
53469-21-9	PCB-1242	1	39	39	7.3	U
12672-29-6	PCB-1248	1	39	39	4.3	U
11097-69-1	PCB-1254	1	39	39	7.0	U
11096-82-5	PCB-1260	1	39	39	5.2	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		39.1	38.3	98	60 - 125	
Tetrachloro-m-xylene		39.1	36.1	92	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB82B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-06 File ID: A175499-0

Sampled: 01/12/07 10:10 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 06:58

Solids: 81.80 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	40	40	5.3	U
11104-28-2	PCB-1221	1	82	82	15	U
11141-16-5	PCB-1232	1	40	40	5.5	U
53469-21-9	PCB-1242	1	40	40	7.6	U
12672-29-6	PCB-1248	1	40	40	4.5	U
11097-69-1	PCB-1254	1	40	40	7.3	U
11096-82-5	PCB-1260	1	40	40	5.4	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		40.7	40.7	100	60 - 125	
Tetrachloro-m-xylene		40.7	38.4	94	32 - 129	

* Values outside of QC limits

ANALYSIS DATA SHEET

54SB82C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-07 File ID: A175500-0

Sampled: 01/12/07 10:15 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 07:16

Solids: 79.89 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	41	41	5.4	U
11104-28-2	PCB-1221	1	84	84	15	U
11141-16-5	PCB-1232	1	41	41	5.6	U
53469-21-9	PCB-1242	1	41	41	7.8	U
12672-29-6	PCB-1248	1	41	41	4.6	U
11097-69-1	PCB-1254	1	41	41	7.5	U
11096-82-5	PCB-1260	1	41	41	5.5	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		41.7	40.7	98	60 - 125	
Tetrachloro-m-xylene		41.7	39.2	94	32 - 129	

* Values outside of QC limits

01360

ANALYSIS DATA SHEET

DUP4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Soil Laboratory ID: 0701199-08 File ID: A175501-0

Sampled: 01/12/07 10:15 Prepared: 01/15/07 12:32 Analyzed: 01/19/07 07:34

Solids: 75.65 Preparation: 3550B Sonication Extrac Initial/Final: 30 g / 10 mL

QC Batch: 0700415 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
12674-11-2	PCB-1016	1	44	44	5.7	U
11104-28-2	PCB-1221	1	89	89	16	U
11141-16-5	PCB-1232	1	44	44	5.9	U
53469-21-9	PCB-1242	1	44	44	8.2	U
12672-29-6	PCB-1248	1	44	44	4.9	U
11097-69-1	PCB-1254	1	44	44	7.9	U
11096-82-5	PCB-1260	1	44	44	5.8	U
System Monitoring Compound		**ADDED (ug/kg dry)**	**CONC (ug/kg dry)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		44.1	44.4	101	60 - 125	
Tetrachloro-m-xylene		44.1	40.9	93	32 - 129	

* Values outside of QC limits

01369

ANALYSIS DATA SHEET

EQBK-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-33

Client: URS Group, Inc. Project: RFAAP SWMU 54 RFI/CMS

Matrix: Water Laboratory ID: 0701199-09 File ID: A175508-0

Sampled: 01/12/07 12:15 Prepared: 01/15/07 13:16 Analyzed: 01/19/07 09:38

Solids: Preparation: 3510C Liquid-Liquid Ex Initial/Final: 1030 mL / 2 mL

QC Batch: 0700424 Sequence: 7011905 Calibration: 7A19001 Instrument: 144

CAS No.	Analyst	Dilution	CONC. (ug/L)	MRL	MDL	Q
12674-11-2	PCB-1016	1	0.20	0.20	0.046	U
11104-28-2	PCB-1221	1	0.20	0.20	0.053	U
11141-16-5	PCB-1232	1	0.20	0.20	0.050	U
53469-21-9	PCB-1242	1	0.20	0.20	0.053	U
12672-29-6	PCB-1248	1	0.20	0.20	0.024	U
11097-69-1	PCB-1254	1	0.20	0.20	0.038	U
11096-82-5	PCB-1260	1	0.20	0.20	0.045	U
System Monitoring Compound		**ADDED (ug/L)**	**CONC (ug/L)**	**% Rec.**	**QC Limits**	**Q**
Decachlorobiphenyl		0.194	0.178	92	40 - 135	
Tetrachloro-m-xylene		0.194	0.177	91	36 - 114	

* Values outside of QC limits

01378

SAMPLE ID SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

SDG: 36440-33

Project: RFAAP SWMU 54 RFI/CMS

Client Sample Id:	Lab Sample Id:
54SB81A	0701158-08
54SB81B	0701158-09
54SB81C	0701158-10
DUP3	0701158-11
EQBK3	0701188-12

01701

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

54SB81A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 13:06
Solids: 86.09
Laboratory ID: 0701158-08

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 01/15/07 07:00
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0700393

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total J,S	5.7	mg/kg dry wt.	1	0.20	0.041		01/19/07 14:01 J,S

01703

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

54SB81B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 13:11
Solids: 85.70
Laboratory ID: 0701158-09

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 01/15/07 07:00
Initial/Final: 0.4999 g / 250 mL
QC Batch: 0700393

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total JLS	4.9	mg/kg dry wt.	1	0.20	0.041		01/19/07 14:03 JLS

01704

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

54SB81C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 13:16
Solids: 80.08
Laboratory ID: 0701158-10

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 01/15/07 07:00
Initial/Final: 0.5003 g / 250 mL
QC Batch: 0700393

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total JLS	6.6	mg/kg dry wt.	1	0.20	0.041		01/19/07 14:16 JLS

01705

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 00:00
Solids: 0.00
Laboratory ID: 0701158-11

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3050B Digestion
Prepared: 01/15/07 07:00
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0700393

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total J15	7.1	mg/kg dry wt.	1	0.20	0.041		01/19/07 14:18

01706

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

EQBK3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Water
Sampled: 01/11/07 14:15
Solids: 0.00
Laboratory ID: 0701188-12

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: 3020A Digestion
Prepared: 01/15/07 07:00
Initial/Final: 25 mL / 125 mL
QC Batch: 0700392

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	1.0	ug/L	1	1.0	0.24	U	01/19/07 15:10

01707

SAMPLE ID SUMMARY

USEPA-3550B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-33
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS

Client Sample Id:	Lab Sample Id:
54SB42A	0701124-01
54SB42B	0701124-02
54SB42C	0701124-03
DUP-1	0701124-04
54SB46A	0701124-05
54SB46C	0701124-06
54SB3A	0701158-01
54SB3B	0701158-02
54SB3C	0701158-03
54SB10A	0701158-04
54SB10B	0701158-05
54SB10C	0701158-06
DUP2	0701158-07
54SB81A	0701158-08
54SB81B	0701158-09
54SB81C	0701158-10
54SB33A	0701158-12
54SB22A	0701188-01
54SB22B	0701188-02
54SB22C	0701188-03
54SB57A	0701188-04
54SB83A	0701188-05
54SB83B	0701188-06
54SB83C	0701188-07
DUP-3	0701188-08
54SB23A	0701199-01
54SB23B	0701199-02
54SB23C	0701199-03
54SB32C	0701199-04
54SB82A	0701199-05
54SB82B	0701199-06
54SB82C	0701199-07
DUP4	0701199-08

01792

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB42A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/08/07 16:00
Solids: 82.88
Laboratory ID: 0701124-01

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:16
Initial/Final: 10 g / 10 mL
QC Batch: 0700567

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	83	%	1	0.1	0.1		01/18/07 14:16

01794

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB42B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/08/07 16:15
Solids: 83.34
Laboratory ID: 0701124-02

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:16
Initial/Final: 10 g / 10 mL
QC Batch: 0700567

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	83	%	1	0.1	0.1		01/18/07 14:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB42C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/08/07 16:25
Solids: 83.95
Laboratory ID: 0701124-03

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:16
Initial/Final: 10 g / 10 mL
QC Batch: 0700567

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	84	%	1	0.1	0.1		01/18/07 14:16

01796

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/08/07 00:00
Solids: 82.28
Laboratory ID: 0701124-04

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:16
Initial/Final: 10 g / 10 mL
QC Batch: 0700567

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	82	%	1	0.1	0.1		01/18/07 14:16

01797

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB46A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/09/07 10:30
Solids: 81.79
Laboratory ID: 0701124-05

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:16
Initial/Final: 10 g / 10 mL
QC Batch: 0700567

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	82	%	1	0.1	0.1		01/18/07 14:16

01798

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB46C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/09/07 10:45
Solids: 80.25
Laboratory ID: 0701124-06

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:16
Initial/Final: 10 g / 10 mL
QC Batch: 0700567

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	80	%	1	0.1	0.1		01/18/07 14:16

01799

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB3A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 10:05
Solids: 82.34
Laboratory ID: 0701158-01

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	82	%	1	0.1	0.1		01/18/07 14:18

01800

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB3B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 10:10
Solids: 88.78
Laboratory ID: 0701158-02

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	89	%	1	0.1	0.1		01/18/07 14:18

01801

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB3C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 10:15
Solids: 87.35
Laboratory ID: 0701158-03

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	87	%	1	0.1	0.1		01/18/07 14:18

01802

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB10A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 10:51
Solids: 82.97
Laboratory ID: 0701158-04

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	83	%	1	0.1	0.1		01/18/07 14:18

01803

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB10B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 10:57
Solids: 79.66
Laboratory ID: 0701158-05

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	80	%	1	0.1	0.1		01/18/07 14:18

01804

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB10C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 11:04
Solids: 85.83
Laboratory ID: 0701158-06

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	86	%	1	0.1	0.1		01/18/07 14:18

01805

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

DUP2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 00:00
Solids: 84.25
Laboratory ID: 0701158-07

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	84	%	1	0.1	0.1		01/18/07 14:18

01806

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB81A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 13:06
Solids: 86.09
Laboratory ID: 0701158-08

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	86	%	1	0.1	0.1		01/18/07 14:18

01807

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB81B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 13:11
Solids: 85.70
Laboratory ID: 0701158-09

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	86	%	1	0.1	0.1		01/18/07 14:18

01808

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB81C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 13:16
Solids: 80.08
Laboratory ID: 0701158-10

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	80	%	1	0.1	0.1		01/18/07 14:18

01809

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB33A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 14:35
Solids: 81.91
Laboratory ID: 0701158-12

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/18/07 14:18
Initial/Final: 10 g / 10 mL
QC Batch: 0700569

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	82	%	1	0.1	0.1		01/18/07 14:18

01810

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB22A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/11/07 15:05
Solids: 83.06
Laboratory ID: 0701188-01

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 13:28
Initial/Final: 10 g / 10 mL
QC Batch: 0700748

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	83	%	1	0.1	0.1		01/23/07 13:28

01811

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB22B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/11/07 15:10
Solids: 81.22
Laboratory ID: 0701188-02

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 13:28
Initial/Final: 10 g / 10 mL
QC Batch: 0700748

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	81	%	1	0.1	0.1		01/23/07 13:28

01812

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB22C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/11/07 15:15
Solids: 79.72
Laboratory ID: 0701188-03

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 13:28
Initial/Final: 10 g / 10 mL
QC Batch: 0700748

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	80	%	1	0.1	0.1		01/23/07 13:28

01813

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB57A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/11/07 12:10
Solids: 85.73
Laboratory ID: 0701188-04

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 13:28
Initial/Final: 10 g / 10 mL
QC Batch: 0700748

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	86	%	1	0.1	0.1		01/23/07 13:28

01814

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB83A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/11/07 10:12
Solids: 88.15
Laboratory ID: 0701188-05

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 13:28
Initial/Final: 10 g / 10 mL
QC Batch: 0700748

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	88	%	1	0.1	0.1		01/23/07 13:28

01815

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB83B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/11/07 10:17
Solids: 82.92
Laboratory ID: 0701188-06

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 13:28
Initial/Final: 10 g / 10 mL
QC Batch: 0700748

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	83	%	1	0.1	0.1		01/23/07 13:28

01816

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB83C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/11/07 10:24
Solids: 81.46
Laboratory ID: 0701188-07

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 13:28
Initial/Final: 10 g / 10 mL
QC Batch: 0700748

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	81	%	1	0.1	0.1		01/23/07 13:28

01817

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

DUP-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/11/07 00:00
Solids: 80.99
Laboratory ID: 0701188-08

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 13:28
Initial/Final: 10 g / 10 mL
QC Batch: 0700748

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	81	%	1	0.1	0.1		01/23/07 13:28

01818

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB23A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/12/07 09:18
Solids: 85.97
Laboratory ID: 0701199-01

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 12:50
Initial/Final: 10 g / 10 mL
QC Batch: 0700750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	86	%	1	0.1	0.1		01/23/07 12:50

01819

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB23B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/12/07 09:23
Solids: 82.43
Laboratory ID: 0701199-02

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 12:50
Initial/Final: 10 g / 10 mL
QC Batch: 0700750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	82	%	1	0.1	0.1		01/23/07 12:50

01820

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB23C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/12/07 09:28
Solids: 83.18
Laboratory ID: 0701199-03

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 12:50
Initial/Final: 10 g / 10 mL
QC Batch: 0700750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	83	%	1	0.1	0.1		01/23/07 12:50

01821

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB32C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/12/07 09:05
Solids: 82.45
Laboratory ID: 0701199-04

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 12:50
Initial/Final: 10 g / 10 mL
QC Batch: 0700750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	82	%	1	0.1	0.1		01/23/07 12:50

01822

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB82A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/12/07 10:05
Solids: 85.21
Laboratory ID: 0701199-05

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 12:50
Initial/Final: 10 g / 10 mL
QC Batch: 0700750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	85	%	1	0.1	0.1		01/23/07 12:50

01823

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB82B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/12/07 10:10
Solids: 81.80
Laboratory ID: 0701199-06

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 12:50
Initial/Final: 10 g / 10 mL
QC Batch: 0700750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	82	%	1	0.1	0.1		01/23/07 12:50

01824

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

54SB82C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/12/07 10:15
Solids: 79.89
Laboratory ID: 0701199-07

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 12:50
Initial/Final: 10 g / 10 mL
QC Batch: 0700750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	80	%	1	0.1	0.1		01/23/07 12:50

01825

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

DUP4

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/12/07 10:15
Solids: 75.65
Laboratory ID: 0701199-08

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
Preparation: Method-Specific Prepara
Prepared: 01/23/07 12:50
Initial/Final: 10 g / 10 mL
QC Batch: 0700750

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	76	%	1	0.1	0.1		01/23/07 12:50

01826

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 2/12/07
DV Level: II III IV

Review Document:
_X__ Region III Modified for National Functional Guidelines
_X__ SW-846
_X__ Project QAPP/SAP

Project Name: Radford Swmu 54
Project Number:
Laboratory: TriMatrix
SDG No.: 36440-33
Test Name: Explosives
Method No.: 8330

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 ^{O}C, then flag L(+)/UL(-).			
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve? If no, flag "R".	✓		
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".	✓		
4.3	Were continuing calibration standards analyzed every 12 hours or twenty samples? If no, flag "R".	✓		
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±15%) or %D(≤15%) within	✓		
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>15%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 15%, J(+), only. Negative Bias - %D>-15% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes:

5.0 Laboratory Control Sample (LCS)		Yes	No	NA
5.1	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.2	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
5.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.		✓	

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	✓		
6.2	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			✓
6.3	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓
	<10% low high			
	Positives L L K			
	Non-detects R UL No action			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional judgement.			

Notes:

MSD for 545883B 7120. for 3-nitrotoluene at 124%.

Parent ND, No action.

8.0 Field Duplicate		Yes	No	NA
8.1	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes:

All NDs ✓

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	✓		
10.1.1	Number of samples:			
10.1.2	Number of target compounds in each analysis: 14			
10.1.3	Number of results rejected or not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%.			

Notes:

Quality Control Results – Nitroaromatic Explosives

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications for both the primary and confirmation columns were method-compliant.

Method Blanks

No target analytes were detected.

Surrogates

All surrogate recoveries were in control for both the primary column and confirmation column runs.

Laboratory Control Samples

The soil Laboratory Control Sample (LCS) and aqueous LCS/LCSD were fortified with all target analytes. All recoveries (and RPDs for the LCS/LCSD) were in control for both the primary column and confirmation column runs.

Matrix Spikes

Samples '54SB83B' and '54SB82B'were fortified with all target analytes. All recoveries and RPDs were in control with the exception of the MSD recovery (124%) for 3-Nitrotoluene in sample '54SB83B'. Since there were no detections for any target analyte in either spiked sample, the MS/MSDs were not analyzed on the confirmation column.

Sample Results

See Section B. Second-column analysis was needed for two samples due to tentative detections of one or more target analytes on the primary column. Those confirmation analyses are identified by the laboratory sample ID plus an 'RE1' suffix. The confirmation analyses were performed at a different date and/or time and, for the two samples for which a tentative detection was confirmed, summary forms and raw data have been included following that for the primary column. Where an analyte was confirmed, both sets of sample results have been reported (all RPDs were less than 40%).

Corrective Actions

No corrective actions were deemed necessary.

Statements of Data Qualification

See Narrative Attachment 2.

This report shall not be reproduced except in full, without written authorization of TriMatrix Laboratories, Inc.
Individual sample results relate only to the sample tested.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8330

54SB83B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Soil

SDG: 36440-33

Project: RFAAP SWMU 54 RFI/CMS

Preparation: 8330 Extraction

Initial/Final: 2 g / 20 mL

Laboratory ID: 0700434-MSD1

QC Batch: 0700434

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.00	2.12	106	6	20	75 - 125	mg/kg dry wt.
1,3-Dinitrobenzene	2.00	2.06	103	0.7	20	80 - 125	mg/kg dry wt.
2,4,6-Trinitrotoluene	2.00	2.17	109	1	20	55 - 140	mg/kg dry wt.
2,4-Dinitrotoluene	2.00	2.19	110	5	20	80 - 125	mg/kg dry wt.
2,6-Dinitrotoluene	2.00	2.18	109	7	20	80 - 120	mg/kg dry wt.
2-Amino-4,6-dinitrotoluene	4.00	4.07	102	1	20	80 - 125	mg/kg dry wt.
2-Nitrotoluene	2.00	2.37	119	14	20	80 - 125	mg/kg dry wt.
3-Nitrotoluene	2.00	2.47	124 *	17	20	75 - 120	mg/kg dry wt.
4-Amino-2,6-dinitrotoluene	2.00	2.17	109	2	20	80 - 125	mg/kg dry wt.
4-Nitrotoluene	2.00	2.45	123	4	20	75 - 125	mg/kg dry wt.
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.00	2.24	112	10	20	70 - 135	mg/kg dry wt.
Methyl-2,4,6-trinitrophenylnitram	2.00	2.14	107	5	20	10 - 150	mg/kg dry wt.
Nitrobenzene	2.00	2.15	108	0.9	20	75 - 125	mg/kg dry wt.
Octahydro-1,3,5,7-tetranitro-1,3,5	2.00	1.89	94	3	20	75 - 125	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: RA
Date: 2/12/07
DV Level: II III IV

Review Document:

X SW-846 - 8081/8082
X NFG - Region III Modifications
X project QAPP

Project Name: Radford SWMU54
Project Number:
Laboratory: TriMatrix
SDG No.: 36440-33
Test Name: Pest/PCBs
Method No.: 8081/8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 °C, then flag L(+)/UL(-).		✓	
1.5	Do any soil samples contain more than 50% water? If yes, no dry weight correction is made and make notes in the DV Report.		✓	

Notes:

2.0 Holding Times		Yes	No	NA
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks prepared at the appropriate frequency (one per 20 samples or batch and matrix)?	✓		
3.2	Do any blanks have positive results? If yes, positive sample results should be reported and qualified "B", if the [sample≤5X[blank].		✓	
3.3	Do any field equipment blanks have positive results? If yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve for 1016, 1260, toxaphene, and technical chlordane; and at least one point for the other arochlors reported? If no, flag "R".	✓		
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".	✓		
4.3	Were continuing calibration standards analyzed every 12 hours or twenty samples? If no, flag "R".	✓		
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±15%) or %D(≤15%) within the control limits?		✓	
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>15%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 15%, J(+), only. Negative Bias - %D>-15% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes:

Pest → CC 1/20/07 beta-BHC, delta-BHC 71% at 17r. w/ pos bias
No action, all NDs ✓

5.0 GC/ECD Instrument Performance Check		Yes	No	NA
5.1	Has a Performance Evaluation Mixture (PEM) been analyzed at the beginning, every 12 hours, and at the end of every sequence.	✓		
5.2	Is the 4,4'-DDT breakdown </= to 20%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non detect DDT results, DDD/DDE - R(+).	✓		
5.3	Is the endrin breakdown </= to 20%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	✓		
5.4	Is the combined breakdowns less than or equal to 30%? If No, for positive DDT/endrin results, DDT/endrin-L(+), DDD/DD/endrin aldehyde/endrin ketone - NJ(+). For non-detect DDT/endrin results, DDD/DDE/endrin aldehyde/endrin ketone - R(+).	✓		

Notes:

6.0 Surrogate Recovery

		Yes	No	NA
6.1	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	✓		
6.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks? Advisory limit: 60-150%.	✓		
6.3	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			✓
6.4	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
1 out	high/low	No action	No action
2 out	2 high same column	K	No action
	2 low same column	L, UL	No action
	mixed same column	J, UJ	No action
	2 high diff columns	J	Not applicable
	2 low diff columns	J, UJ	Not applicable
	mixed diff columns	Professional judgement	Not applicable
3 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	2 high, 1 low	K (2 high)	J (1 low 2nd column)
	2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
	other mixed	J, UJ	Not applicable
4 out	All high	K	Not applicable
	All low	L, UL	Not applicable
	Mixed	J, UJ	Not applicable

If any recovery is >0% and <10% then L(+)/R(-).
If any recovery is 0% then R(+/-).

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
7.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	✓		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.2	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 545B42A , DUP-1 RL
PCB-1254 40 J 37 J ~~40~~ OK
PCB-1260 29 J 19 J 40 OK

10.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns <40%? If No, J(+).		✓	
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	✓		

Notes: PCB-1254 and/or PCB-1260 >D 40% in several samples J/J-
PCB-1254 "E" in 545B46C J/J- use DF=10 result.
" " 545B46A " "

11.0 Data Completeness

		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit 95%$_{aq}$ and 90%$_{so}$)	✓		
11.1.1	Number of samples: Pest_____ PCB_____			
11.1.2	Number of target compounds in each analysis: PEST_____ PCB_____			
11.1.3	Number of results rejected and not reported: Pest_____ PCB_____			
11.1.4	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = Pest 100% PCB 100%			

Notes:

Quality Control Results – Chlorinated Pesticides

Note: second column (confirmation) data is identified as the compound[2C].

Calibration

Initial instrument calibrations, second source verification (SCV), and continuing calibration verifications (CCV) for both the primary and confirmation columns were method-compliant for all target analytes (including Toxaphene) with the following exceptions:

1) increasing responses for beta-BHC (17%) and delta-BHC (17%) in CCV5 associated with calibration 7A23003.

Method Blank

No target analytes were detected.

Surrogates

All surrogate recoveries were in control for both the primary column and confirmation column runs.

Laboratory Control Sample

Soil and aqueous Laboratory Control Samples (LCS) were fortified with all target analytes. LCS's for the one multi-component analyte (i.e., Toxaphene) were separately extracted/analyzed. All recoveries were in control for both the primary column and confirmation column runs.

Matrix Spikes

Samples '54SB22A' and '54SB82B'were fortified with all target analytes. MS/MSDs for the one multi-component analyte (i.e., Toxaphene) for each sample were separately extracted/analyzed. All recoveries and RPDs for both the primary column and confirmation column runs were in control.

Sample Results

Please see Section C of the data package. No analyte required confirmation.

Corrective Actions

No corrective actions were deemed necessary, including any for samples associated with CCV5 since the responses for the two target analytes were increasing and there were no detections in the samples.

Statements of Data Qualification

No statements were generated.

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Individual sample results relate only to the sample tested.

CONTINUING CALIBRATION CHECK
USEPA-8081A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-33
Client: URS Group, Inc.
Project: RFAAP SWMU 54 RFI/CMS
Instrument ID: 199
Calibration: 7A23003
Lab File ID: A47_212-0
Calibration Date: 01/18/07 10:02
Sequence: 7012322
Injection Date: 01/20/07
Lab Sample ID: 7012322-CCV5
Injection Time: 03:25

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
alpha-BHC	Q	0.0400	0.0460	7152249	8924210		15.00	15
beta-BHC	Q	0.0400	0.0469	2732922	3141860		17.00	15 *
gamma-BHC (lindane)	Q	0.0400	0.0449	6398192	7524440		12.00	15
delta-BHC	Q	0.0400	0.0466	5826683	7036030		17.00	15 *
alpha-Chlordane	Q	0.0400	0.0457	5137664	5849060		14.00	15
gamma-Chlordane	Q	0.0400	0.0449	5437327	6151920		12.00	15
4,4'-DDD	Q	0.0400	0.0451	3787696	4396320		13.00	15
4,4'-DDE	Q	0.0400	0.0453	4887201	5729790		13.00	15
4,4'-DDT	Q	0.0400	0.0447	4334143	4893970		12.00	15
Aldrin	Q	0.0400	0.0456	5993107	7006860		14.00	15
Dieldrin	Q	0.0400	0.0457	5089881	5918100		14.00	15
Endosulfan I	Q	0.0400	0.0456	4783258	5482940		14.00	15
Endosulfan II	Q	0.0400	0.0455	4183496	4746350		14.00	15
Endosulfan Sulfate	Q	0.0400	0.0452	3833250	4280250		13.00	15
Endrin	Q	0.0400	0.0452	4670889	5367790		13.00	15
Endrin Aldehyde	Q	0.0400	0.0455	3274610	3670380		14.00	15
Endrin Ketone	Q	0.0400	0.0450	4283622	4753400		13.00	15
Heptachlor	Q	0.0400	0.0460	6684693	7903820		15.00	15
Heptachlor Epoxide	Q	0.0400	0.0449	5399612	6097550		12.00	15
Methoxychlor	Q	0.0400	0.0448	2346588	2543030		12.00	15

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

00780

Quality Control Results – Polychlorinated Biphenyls

Note: second column (confirmation) data is identified as the compound[2C].

Calibration

Initial instrument calibrations, second source verification (SCV), and continuing calibration verifications (CCV) for both the primary and confirmation columns were method-compliant.

Note: Although not required by Method 8082, daily one-point calibration verifications for Aroclors 1221, 1232, 1242, 1248, and 1254 are performed per TriMatrix internal procedures. Due to a LIMS software issue, %D values are not calculated for one-point calibrations, hence their absence on the continuing calibration summary form for each of those Aroclors.

Method Blank

No target analytes were detected.

Surrogates

All surrogate recoveries were in control for both the primary column and confirmation column runs.

Laboratory Control Sample

Soil and aqueous Laboratory Control Samples (LCS) were fortified with Aroclors 1016 and 1260. All recoveries were in control.

Matrix Spikes

Samples '54SB83B' and '54SB82B'were fortified with Aroclors 1016 and 1260. All recoveries and RPDs for both the primary column and confirmation column runs were in control.

Sample Results

Please see Section D of the data package. There were detections for Aroclors 1254 and/or 1260 in multiple samples. Reanalysis at dilution for samples '54SB46A' and '54SB46C' was needed. Those reanalyses are identified by the laboratory sample ID plus an 'RE1' suffix.

Statements of Data Qualification

See Narrative Attachment 2.

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DUAL COLUMN CONFIRMATION CHECK

54SB42A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/08/07 16:00
Solids: 82.88
QC Batch: 0700402
GC Column(1): RTX CLP2

Laboratory ID: 0701124-01
Prepared: 01/15/07 08:11
Preparation: 3550B Sonication
Sequence: 7011905
GC Column(2): RTX CLP

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
File ID: A175462-0
Analyzed: 01/18/07 19:59
Instrument: 144

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1254	1	7.6		7.6	58025.49		26	
	* 2	6.67		6.67	130187.6		40	42.4
PCB-1260	1	7.6	7.081667	0.518	60775.92		22	
	* 2	7.14	6.98	0.16	178391.3		29	27.4

* Column used for quantitation

01679

DUAL COLUMN CONFIRMATION CHECK

54SB46A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/09/07 10:30
Solids: 81.79
QC Batch: 0700415
GC Column(1): RTX CLP2

Laboratory ID: 0701124-05
Prepared: 01/15/07 12:32
Preparation: 3550B Sonication
Sequence: 7011905
GC Column(2): RTX CLP

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
File ID: A175488-0
Analyzed: 01/19/07 03:42
Instrument: 144

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1254	* 1	7.6		7.6	2530000		2000	50.0
	2	5.92		5.92	3760000		1200	
PCB-1260	* 1	7.6	7.081667	0.518	2160000		380	41.2
	2	7.12	6.98	0.14	2710000		250	

* Column used for quantitation

01682

DUAL COLUMN CONFIRMATION CHECK

54SB46C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/09/07 10:45
Solids: 80.25
QC Batch: 0700415
GC Column(1): RTX CLP2

Laboratory ID: 0701124-06
Prepared: 01/15/07 12:32
Preparation: 3550B Sonication
Sequence: 7011905
GC Column(2): RTX CLP

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
File ID: A175489-0
Analyzed: 01/19/07 04:00
Instrument: 144

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1254	* 1	7.6		7.6	2120000		2000	58.1
	2	5.92		5.92	3210000		1100	
PCB-1260	* 1	7.6	7.081667	0.518	1710000		510	40.0
	2	7.13	6.98	0.15	2400000		340	

* Column used for quantitation

01684

DUAL COLUMN CONFIRMATION CHECK

54SB3A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Soil
Sampled: 01/10/07 10:05
Solids: 82.34
QC Batch: 0700402
GC Column(1): RTX CLP2

Laboratory ID: 0701158-01
Prepared: 01/15/07 08:11
Preparation: 3550B Sonication
Sequence: 7011905
GC Column(2): RTX CLP

SDG: 36440-33
Project: RFAAP SWMU 54 RFI/CMS
File ID: A175466-0
Analyzed: 01/18/07 21:10
Instrument: 144

Analyte	Col.	RT	EXP RT	Diff.	Area	Amount	Conc.	RPD
PCB-1254	1	7.59		7.59	79756.2		18	
	* 2	6.67		6.67	154430.1		28	45.4
PCB-1260	1	7.59	7.081667	0.508	111319.6		66	
	* 2	7.13	6.98	0.15	293004.8		78	16.7

* Column used for quantitation

01686

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-33
Project No.: _____

Pb only

Project Name: SWMU54 - Radford
Reviewer: RA
Date: 2/12/07

		6020			6010B			CVAA-Hg			Cyanide		
1.0 Chain of Custody/Sample Condition/Raw Data		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓											
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓											
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓										
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)	✓											
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	✓											

Note: _____

		6020			6010B			CVAA-Hg			Cyanide		
2.0 Holding Time		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		✓										

Note: _____

3.0 Instrument Calibration		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".		✓										
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).	✓											
3.3	Once per calibration, did a high and low distilled standard recovery within 85-115%? If no, follow 3.6.												
3.4	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".		✓										
3.5	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.		✓										
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP 90%-110%, FOR Hg 80-120%, FOR CN 85-115%.		✓										
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%												
3.7	For ICP & ICPMS, did the CRDL standard recover between 80-120%?		✓										
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K												

Note: _____

4.0 Blanks

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	✓											
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	✓											
4.3	Are there reported MB or ICB/CCBs values > MDL?		✓										
	Sample Results > MDL												
	< 5X Blank Contamination B												
4.4	Are there negative blank results with the absolute value > MDL?		✓										
	Sample Results Non-detects > MDL												
	< 5X absolute Blank Contamination UL L												
4.5	Are there reported field blank > ± MDL?		✓										
	Sample Results > MDL												
	< 5X Blank Contamination B												

Note: _____

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	✓											
5.2	Are the ICS AB recoveries within 80% - 120%?	✓											
5.3	Are the results for unspiked analytes (in ICS A) < ± RL?	✓											
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			✓									
	If not...												
	Action: Not Spiked Analytes: < -MDL L(+)/UL(-); > MDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)												

Note: [redacted] _____

6.0 Laboratory Control Sample (LCS)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	√											
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		√										
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)												

Note:

7.0 Laboratory Duplicates (MSD)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	√											
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.												
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	√											

Note:

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	✓											
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125% for aqueous matrices or lab limits for soil matrices?	✓											
	%R > 125% 30%< %R < 74% < 30%												
	Positive K L L												
	Non-detect None UL R												
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.			✓									

Note:

9.0 Instrument Detection Limits (IDL)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	✓											

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	✓											
10.2	Was a five-fold dilution performed?	✓											
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).		✓										

Note: ~~NA, Ag only~~

Serial Dilution ~~NA~~.
on 545B81B 7 10%, at 14%.
DOS results → J/s

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	✓											
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.												
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report	✓											

Note: 545B51A DUP3 RPD
Pb 5.7 7.1 22% OK ✓

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	✓											
12.2	Were all dilution reflected in the positive results and detection limits?	✓											
12.3	Were the Internal Standard recoveries within 30-120%	✓											
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	✓											
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	✓											
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	✓											

Note:

13.0 Completeness Calculation		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	✓											
13.1.1	Number of samples:												
13.1.2	Number of target compounds in each analysis:												
13.1.3	Number of results rejected and not reported:												
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)												
	% Completeness = 100.1												

Note:

Quality Control Results – ICP/MS Metals

Calibration

All instrument calibrations and continuing calibrations were method-compliant. Note: instrument reports for ICPMS include the listing of initial calibration correlation coefficients and internal standard recoveries; those values may either be imbedded with raw data from each run or included as a summary (also within the instrument printout).

Note: TriMatrix interprets the QSM requirement for a "low-level calibration check standard" as one pertaining to a one-point initial calibration. Given that a multi-point initial calibration was performed, the specification for a low-level calibration check either does not apply or has been satisfied since the lowest calibration standard is equivalent in concentration to the reporting limit.

Method Blanks

Lead was not detected.

Internal Standard Response

Internal standard responses for all standards, samples, and quality control samples were method-compliant.

Laboratory Control Sample

All Laboratory Control Sample recoveries were in control.

Matrix Spike

Sample '54SB81B' was fortified with Lead. Both recoveries and the RPD were in control.

Serial Dilutions and Post-Digestion Spikes

Serial dilution (SD) and post-digestion spike (PDS) analysis was performed on the sample employed for MS/MSD analysis. The SD value exceeded criterion; see the Serial Dilution summary and Statements of Data Qualification for details. The PDS value was in control.

Sample Results

Please see Section E of the data package.

Note: for all soil samples for metals analysis, a representative subsample is dried and a smaller measured amount of that dried subsample is then digested. Unlike most other parameters for a soil sample that are processed on a wet-weight basis, a Percent Solids value (if determined) for the sample is not applied to the MDL, RL, or to the result.

Statements of Data Qualification

See Narrative Attachment 2.

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Individual sample results relate only to the sample tested.

Quality Control Results – Wet Chemistry (Percent Solids)

Calibration

Instrument calibrations (i.e., balance) were in control.

Method Blanks

All method blanks were in control.

Laboratory Control Sample

Not applicable.

Matrix Spikes

Not applicable.

Laboratory Duplicate.

Samples '54SB42A', '54SB3A', '54SB81B', '54SB22A', '54SB83B', and '54SB82B' were analyzed in duplicate; all RPDs were in control.

Sample Results

Please see Section F of the data package.

Corrective Actions

No corrective actions were needed.

Statements of Data Qualification

No statements were generated.

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Data Review and Approval

All data was reviewed and approved by the group supervisor/manager prior to further review by data management staff and the project chemist.

Data Deliverables

The data deliverables, both hardcopy and electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD has been issued separate from this hardcopy report.

Walt Roudebush, Project Chemist

2/20/07
Date

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Individual sample results relate only to the sample tested.

SERIAL DILUTION

USEPA-6020A

54SB81B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Soil

% Solids: 85.70

Laboratory ID: 7011922-SRD1

Lab Source ID: 0701158-09

SDG: 36440-33

Project: RFAAP SWMU 54 RFI/CMS

QC Batch: 7011922

Sequence: 7011922

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Lead, Total	0.00983		0.0112		14.0	*	mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

01728

Sample Receipt and Log-in

There were four receipt events.

Receipt Event One

On January 10, 2007 at 08:45 hrs, one sample cooler containing multiple soil samples was received at TriMatrix via FedEx (the carrier). The cooler had been shipped from the Site on January 9.

The external custody seal affixed to the cooler was intact. The samples were received on ice and in good condition. The receipt temperature of the interior of the cooler was measured via a 'temperature blank' shipped in it; the measured temperature, in °C, was 0.5. No sample was received frozen.

Shipping documents included one field chain-of-custody form (COC) and associated carrier air bill.

No sample was designated by the Client for MS/MSD analysis.

Samples were assigned to Work Order 0701124 and SDG 36440-33.

Receipt Event Two

On January 11, 2007 at 08:50 hrs, one sample cooler containing multiple soil samples was received at TriMatrix via FedEx (the carrier). The cooler had been shipped from the Site on January 10.

The external custody seal affixed to the cooler was intact. All samples were received on ice and in good condition. The receipt temperature of the interior of the cooler was measured via a 'temperature blank' shipped in it; the measured temperature, in °C, was 2.5.

Shipping documents included one field chain-of-custody form (COC) and associated carrier air bill.

Sample '54SB81B' was designated by the Client for MS/MSD analysis for Lead (only).

Samples were assigned to Work Order 0701158 and SDG 36440-33.

Receipt Event Three

On January 12, 2007 at 08:50 hrs, one sample cooler containing multiple soil samples and one equipment blank was received at TriMatrix via FedEx (the carrier). The cooler had been shipped from the Site on January 11.

The external custody seal affixed to the cooler was intact. All samples were received on ice and in good condition. The receipt temperature of the interior of the cooler was measured via a 'temperature blank' shipped in it; the measured temperature, in °C, was 1.3.

Shipping documents included one field chain-of-custody form (COC) and associated carrier air bill.

Sample '54SB22A' was designated by the Client for MS/MSD analysis for Pesticides.

Sample '54SB83B' was designated by the Client for MS/MSD analysis for PCBs and Explosives.

Samples were assigned to Work Order 0701188 and SDG 36440-33.

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Individual sample results relate only to the sample tested.

Receipt Event Four

On January 13, 2007 at 09:00 hrs, one sample cooler containing multiple soil samples and one equipment blank was received at TriMatrix via FedEx (the carrier). The cooler had been shipped from the Site on January 12.

The external custody seal affixed to the cooler was intact. All samples were received on ice and in good condition. The receipt temperature of the interior of the cooler was measured via a 'temperature blank' shipped in it; the measured temperature, in °C, was 0.8. No sample was received frozen.

Shipping documents included one field chain-of-custody form (COC) and associated carrier air bill.

Sample '54SB82B' was designated by the Client for MS/MSD analysis for Pesticides, PCBs, and Explosives.

Samples were assigned to Work Order 0701199 and SDG 36440-33.

All Events

Copies of all referenced receipt and custody documents are provided in Section A of this data package. Correspondence regarding completed sample log-in activities will be found in Attachment 1 of this narrative.

Provision of Sample Receipt Information to Client

A copy of the COCs and receipt checklist were transmitted to the Client within one day of sample receipt. The Client did not request any modification(s) to the analyses, as listed on the COC.

Post-Receipt Sample Custody

Custody of the sample during sample preparation (if applicable) and analysis was assigned to individual analysts. Copies of completed 'internal chain of custody' forms are included in Section A.

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Individual sample results relate only to the sample tested.

Variances

Data Qualifier Flags

Data qualifier flags other than those listed in the DoD QSM were employed or the definition of an existing flag was modified.

J – Estimated: the analyte was detected at a concentration greater than the limit of detection (i.e., MDL) but less than the reporting limit (i.e., MRL).

B – Blank contamination: The analyte was detected above one-half the reporting limit in an associated method blank. The same analyte in the sample was detected at less than five times the method blank concentration. (If a common laboratory contaminant is present in the method blank at a concentration greater than one-half the reporting limit but less than or equal to that reporting limit, any associated sample results are flagged but corrective action is not necessarily taken. A text qualifier is also associated with such a result.)

E – Exceeds calibration range: The analyte response exceeded the calibrated range of the instrument. (With the exception of metals for which only the final non-qualified result is reported, both the initial E-qualified result and final non-qualified result from reanalysis-at-dilution are reported.)

Text Qualifier

A LIMS-generated text qualifier is substituted for many instances in which the DoD QSM "Q" flag would otherwise apply. The text qualifiers are listed in a summary format by parameter with applicable samples identified.

Method 6020A

The acceptance criterion of < 2 x RL was substituted for < 2 x MDL for interference check solution ICS-A.

Analytical Methods

Sample preparation and analytical methods that were employed are per the SOW.

Method Detection Limits, Target Analytes, and Reporting Limits

All method detection limits (MDL) for analytes in this report are compliant with the DoD QSM specification that each reporting limit (RL) employed is to be at least three times the MDL. In addition, no RL is less than the equivalent concentration of the lowest instrument calibration standard. The target analyte list was specified by the Client. Proposed RLs were submitted by TriMatrix to the Client prior to the receipt of any samples.

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Project-specific Analytes of Concern

No project-specific analytes of concern were identified in the SOW.

Quality Control Limits

Quality control limits specified in the DoD QSM were employed. Although Method 6010B LCS recovery limits are specified in the QSM, limits for Method 6020A are not. However, Method 6010B limits from the QSM were employed for Method 6020A.

Hold Times

All samples were extracted/digested (where applicable) and analyzed within hold time.

Technical Issues

There were no general technical issues. Any issues unique to a particular parameter will be discussed in the QC section for it.

Sample Result Reporting Convention

Sample results are reported as RL 'U' (e.g., 0.001 U) if the target analyte was not detected above the MDL. If a sample for an organic parameter is reanalyzed and also reported, the second analysis includes the suffix 'REn' where n = the first, second, etc. reanalysis. If a sample for an organic parameter is reanalyzed for confirmation purposes and also reported, the second analysis includes the suffix 'RE1'.

Data Qualifier Designation

If applicable, a sample result is qualified with:

- a "U" flag if the analyte was not detected at a concentration greater than the MDL,
- a "B", "J", and/or an "E" flag as defined in the preceding Variance section,
- a LIMS-generated statement of qualification. Qualifying statements, if any, will be found in Attachment 2 to this narrative.

QC Batch and Analytical Batch Designation

A QC Batch is a seven digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation); it is limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.).

An Analytical Batch (or Sequence) is a seven digit number that associates all samples analyzed as a set under one analytical sequence.

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Individual sample results relate only to the sample tested.

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Chain of Custody Record

COC No. 116936

Page ____ of ____

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Cart 2
VOA Rack/Tray
Receipt Log No. 35-4
Project Chemist WTS
Laboratory Project No. E 070124

Client Name: URS
Address: 5540 Falmouth St
Richmond VA 23230
Phone 804-965-9000
Fax 804-965-9764

Project Name: SWMU 54 RFI
Client Project No. / P.O. No. 116566531
Invoice To: [X] Client [ ] Other (comments)
Contact/Report To: Roshanak Arayan

Analyses Requested

Container Type (corresponds to Container Packing List): 17 17

Number of Containers Submitted: Pesticides 8081A; PCBs 8082

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Total	Sample Comments
1	15	SO	01	545B42A	TM 0842	1-8-07	1600		X	SO	1	
2	15	SO	02	545B42B			1615		X	SO	1	
3	15	SO	03	545B42C			1625		X	SO	1	
4	16	SO	04	DUP-1			—		X	SO	1	
5	17	SO	05	545B46A		1-9-07	1030		X	SO	1	added by TriMatrix
6	17	SO	06	545B46C		1-9-07	1045		X	SO	1	
7												
8												
9												
10												

Sampled By (print): John Spangler
Sampler's Signature: [signature]
Company: URS

How Shipped? Hand Carrier Fedex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time

1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Ziegler	1-10-07	8:45

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Chain of Custody Record

COC No. 116938

Page 1 of 2

For Lab Use Only
Cart: 7
VOA Rack/Tray: —
Receipt Log No.: 378
Project Chemist: CVSR
Laboratory Project No.: E 0701158

Client Name: URS
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone: 804-965-9000
Fax: 804-965-9764

Project Name: SWMU 54 RFI
Client Project No. / P.O. No.: 11656531
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Arayan

Analyses Requested

SW8330 Explosives; SW8011A Pesticides; SW8082 PCBs; SW6000 Lead

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted												Total	Sample Comments
											17	17	17	17											
18	SO	01	1	545B3A	Tm 1644	1-10-07	10:05		X	SO	✓	✓	✓											1	
18	SO	02	2	545B3B			10:10		X	SO	✓	✓	✓											1	
18	SO	03	3	545B3C			10:15		X	SO	✓	✓	✓											1	
15	SO	04	4	545B10A			10:51		X	SO		✓	✓											1	
15	SO	05	5	545B10B			10:57		X	SO		✓	✓											1	
15	SO	010	6	545B10C			11:04		X	SO		✓	✓											1	
16	SO	07	7	DUP2			—		X	SO		✓	✓											1	
19	SO	08	8	545B81A			13:06		X	SO		✓	✓	✓										1	
20	SO	09	9	545B81B plus (Lead Only MS/MSD)			13:11		X	SO		✓	✓	✓										1	MS/MSD for lead only
19	SO	10	10	545B81C			13:16		X	SO		✓	✓	✓										1	

Sampled By (print): John Spangler
Sampler's Signature:
Company: URS

How Shipped? Hand Carrier: Fedex
Tracking No.: 858914412003

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	1/10/07	1700						

1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
							1-11-07	0850

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Chain of Custody Record

COC No. 116940

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Cart: 17
VOA Rack/Tray: —
Receipt Log No.: 378
Project Chemist: WJR
Laboratory Project No.: E 0701158

Client Name: URS
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone: 804-965-9000
Fax: 804-965-9764

Project Name: SWMU 54 RFI
Client Project No. / P.O. No.: 11656531
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Arayan

Analyses Requested

Container Type (corresponds to Container Packing List)
SW 6000 Lead
SW 8081A Pesticides
SW 8082 PCBs

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
1	21	SO	11	DUP 3 Lead Only	TM1644	1-10-07	—		X	SO	1	1	Dup for Lead only
2	15	SO	12	54SB33A	↓	↓	14:35		X	SO	1 1	1	
3													
4													
5													
6													
7													
8													
9													
10													

Sampled By (print): John Spangler
Sampler's Signature: [signature]
Company: URS

How Shipped? Hand Carrier: FedEx
Tracking No.: 8589 174, 2003

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	1/10/07	1400						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
[signature]						William Cole	1-11-07	0830

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Chain of Custody Record

COC No. 117561

Page 1 of 2

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Cart: 3
VOA Rack/Tray:
Receipt Log No.: 39-11
Project Chemist: WSR
Laboratory Project No.: E 0701188

Client Name: URS
Address: 5540 Falmouth St Richmond VA 23230
Phone: 804 965-9000
Fax:

Project Name: SWMU 54 RFC
Client Project No. / P.O. No.:
Invoice To: ☑ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested: Pesticides, PCB, Explosives

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted	Total	Sample Comments
1	18	SO	01	54SB22A		1/11/06	1505		✓	Soil			1	MS/MSD
2	15	SO	02	54SB22B			1510		✓				1	
3	15	SO	03	54SB22C			1515		✓				1	
4	~~18~~	~~SO~~		54SB22AMSD			1505		✓				1	MS/MSD for line 1 (WR)
5	23	SO	04	54SB57A			1210		✓				1	
6	18	SO	05	54SB83A			1012		✓				1	
7	24	SO	06	54SB83B			1017		✓				1	
8	18	SO	07	54SB83C			1024		✓				1	
9				54SB83BMS/MSD			1017		✓				1	MS/MSD for line 7 (WR)
10	18	SO	08	DUP-3			—		✓				1	

Sampled By (print): John Spangler
Sampler's Signature:
Company: URS

How Shipped? Hand Carrier: FedEx
Tracking No.:

Comments: Arrow for sample date added by TriMatrix (WR)

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
						Kim Ziegler	1/20/07	10:25

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COC No. 117566

Page 2 of 2

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Cart: 3
VOA Rack/Tray:
Receipt Log No.: 39-11
Project Chemist: WAR
Laboratory Project No.: E 0701188

Client Name: URS
Address: 5540 Falmouth St Ste 201
Richmond VA 23230
Phone: 80 4965 1000
Fax:

Project Name: SWMU 54 RFE
Client Project No. / P.O. No.:
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanack Argo

Analyses Requested

Container Type (corresponds to Container Packing List): 6 2 2

Number of Containers Submitted: Explosives, Metals, TAL+, PCB

Total

Sample Comments

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Total	Sample Comments
25	SO	09	1	545B84A		1/11/06	945		✓	Soil	1	
25	SO	10	2	545B84B			950		✓		1	
25	SO	11	3	545B84C			955		✓		1	
26	WQ	12	4	EQBK3			1415		✓	Water	1	
27	WQ	13	5	EQBK3		↓	1415		✓	Water	4	
			6	~~EQBK3~~								
			7									
			8									
			9									
			10									

Sampled By (print): John Spengler
Sampler's Signature:
Company: URS

How Shipped? Hand Carrier: Fed Ex
Tracking No.:

Comments: arrow for sample date added by TriMatrix (WR)

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time

1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Ziegler	1-12-07	10:25

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Chain of Custody Record

COC No. 116941

Page 1 of 1

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Cart: 1
VOA Rack/Tray:
Receipt Log No.: 41-1
Project Chemist: WSR
Laboratory Project No.: E070199

Client Name: URS
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone: 804-965-9000
Fax: 804-965-9764

Project Name: SWMU 54 RFI
Client Project No. / P.O. No.: 11165653
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak, Aryan

Analyses Requested

Explosives SW8330
PCBs SW8082
Pesticides SW8081A

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted										Total	Sample Comments
15	SO	01	1	54SB23A	TM 1623	1-12-07	9:18		X	SO		4	4									1	
15	SO	02	2	54SB23B			9:23		X	SO		4	4									1	
18	SO	03	3	54SB23C			9:28		X	SO	4	4	4									1	
18	SO	04	4	54SB32C			9:05		X	SO	4	4	4									1	
18	SO	05	5	54SB82A			10:05		X	SO	4	4	4									1	
24	SO	06	6	54SB82B			10:10		X	SO	4	4	4									1	
18	SO	07	7	54SB82C			10:15		X	SO	4	4	4									1	
28	SO	08	8	DUP 4			10:15		X	SO	4	4	4									1	
			9	54SB82B MS/MSD			10:10		X	SO	4	4	4									2	MS/MSD on line 6
29	WQ	09	10	EQBK-5			12:15		X	W	4	4	4									4	

Sampled By (print): Chris Franke
Sampler's Signature:
Company: URS

How Shipped? Hand Carrier
Tracking No.: 8589 1441 2091

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time

1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Zegler	1-13-07	9:00

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-35 **Fraction:** Explosives

Lab: TriMatrix **Project Name** Radford SWMU 54

Reviewer: RA **Date:** April 27, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: The laboratory control sample (LCS) displayed a percent recovery (%R) less than the lower established laboratory control limit of 80% for octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine at 75%. This %R, however, was within the DOD QSM marginal exceedances control limit of 75-120%. In addition, the LCS analyzed for the confirmation analyses displayed an acceptable %R for this compound at 89%. Using professional judgment, positive associated field sample results were flagged "J,l" and non-detects were flagged "UJ,l".

Minor Anomalies: The matrix spike pair analyzed for sample 54MW-2 displayed %Rs outside the control limits for octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (66% and 181%). The associated parent sample result was previously flagged for an LCS anomaly and no further data qualifying action was taken. This matrix spike pair also displayed relative percent differences (RPDs) and a %R outside the control limits for 2,4,6-trinitrotoluene (44%) and 2,6-dinitrotoluene (148% and 48%). The associated parent sample results for 2,4,6-trinitrotoluene and 2,6-dinitrotoluene were positive and were flagged "J,d" and "J,m", respectively.

Several compounds displayed RPDs greater than the control limit of 40% between the two analytical columns for several samples. These results were flagged "J,g" in the associated field samples.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Rayan

SAMPLE ID SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-35
Client: URS Group, Inc.
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Client Sample Id:	Lab Sample Id:
54MW-8	0703452-01
54MW-8	0703452-01RE1
DUP-1	0703452-02
DUP-1	0703452-02RE1
54MW-10	0703452-03
54MW-10	0703452-03RE1
54MW-7	0703452-04
54MW-7	0703452-04RE1
54MW-9	0703452-05
54MW-9	0703452-05RE1
54MW-4	0703452-06
54MW-6	0703452-07
54MW-1	0703467-01
54MW-5	0703467-02
54MW-5	0703467-02RE1
54MW-2	0703467-03
54MW-2	0703467-03RE1
54MW-3	0703467-04
54MW-3	0703467-04RE1
EB-1	0703467-05

DUPS

54MW-10 and DUP-1

Explosives	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	4xRL	Pass/ Fail
1,3,5-trinitrobenzene	ug/L	5	25.0	3.9	J	0		200.0%	3.9	20.0	P
2,4,6-trinitrotoluene	ug/L	5	25.0	12		0		200.0%	12	20.0	P
2,4-dinitrotoluene	ug/L	5	25.0	0		0.27	J	200.0%	0.27	20.0	P
2,6-dinitrotoluene	ug/L	5	25.0	1.4	J	0		200.0%	1.4	20.0	P
2-amino-4,6-dinitrotoluene	ug/L	5	25.0	2.4	J	0		200.0%	2.4	20.0	P
4-amino-2,6-dinitrotoluene	ug/L	5	25.0	2.1	J	0		200.0%	2.1	20.0	P
RDX	ug/L	5	25.0	7.7		0		200.0%	7.7	20.0	P
HMX	ug/L	5	25.0	10		1.9	J	136.1%	8.1	20.0	P

Control limit [sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-8

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703452-01 File ID: data005-0

Sampled: 03/27/07 13:30 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 12:30

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	4.6	5.0	0.045	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	14	5.0	0.10	
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.6	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.3	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	0.85 J,Q	5.0	0.49	J
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	8.1	5.0	0.092	
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	0.68	5.0	0.15	J
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	12 J,Q	5.0	0.20	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	5.44	84	29 - 138	

* Values outside of QC limits

: 00043

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703452-02 File ID: data006-0

Sampled: 03/27/07 00:00 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 13:12

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	0.27 J,8	5.0	0.092	J
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	1.9 J,l	5.0	0.20	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.22	65	29 - 138	

* Values outside of QC limits

00046

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-10

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703452-03 File ID: data007-0

Sampled: 03/27/07 12:11 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 13:54

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	3.9	5.0	0.045	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	12	5.0	0.10	
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	1.4 J,8	5.0	0.16	J
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.4	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.1	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	7.7	5.0	0.092	
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	10 J,8	5.0	0.20	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits.	Q
4-Nitroaniline	6.49	6.24	96	29 - 138	

* Values outside of QC limits

: 00043

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-7

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703452-04 File ID: data008-0

Sampled: 03/27/07 16:28 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 14:37

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	1.2 JD	5.0	0.20	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.48	54	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-9

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703452-05 File ID: data009-0

Sampled: 03/27/07 14:10 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 15:19

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.5 J,J	5.0	0.20	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.12	64	29 - 138	

* Values outside of QC limits

00055

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703452-06 File ID: data010-0

Sampled: 03/27/07 15:55 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 16:01

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0 UJ, Q	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.68	57	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703452-07 File ID: data011-0

Sampled: 03/27/07 10:25 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 16:43

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0 J1J	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.97	61	29 - 138	

* Values outside of QC limits

00061

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703467-01 File ID: data012-0

Sampled: 03/28/07 09:55 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 17:25

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0 UJ,l	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.57	70	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703467-02 File ID: data014-0

Sampled: 03/28/07 10:33 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 18:50

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.19	5.0	0.045	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	0.84 J,g	5.0	0.10	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.71	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.65 J,g	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	0.63 J,g	5.0	0.49	J
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	0.30	5.0	0.15	J
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.7 J,Q	5.0	0.20	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.96	61	29 - 138	

* Values outside of QC limits

: 00067

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703467-03 File ID: data015-0

Sampled: 03/28/07 11:30 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 19:32

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.22	5.0	0.045	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	0.25 J,d	5.0	0.10	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	1.1 J,m	5.0	0.16	J
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.93 J,g	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.57 J,g	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	0.94	5.0	0.49	J
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	6.7 J,l	5.0	0.20	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.08	63	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0703467-04 File ID: data016-0

Sampled: 03/28/07 12:21 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 20:14

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	1.9 JL	5.0	0.20	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.96	61	29 - 138	

* Values outside of QC limits

00073

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

EB-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-35 4MD

Client: URS Group, Inc. Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Water Laboratory ID: 0703467-05 File ID: data017-0

Sampled: 03/28/07 12:45 Prepared: 04/03/07 16:01 Analyzed: 04/06/07 20:56

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0703431 Sequence: 7041011 Calibration: 7D02002 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0 UJ	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.67	72	29 - 138	

* Values outside of QC limits

: 00076

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 4/25/07
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
_X__ SW-846
_X__ Project QAPP/SAP

Project Name: Radford Scmu 54
Project Number: 116563.51
Laboratory: TriMatrix
SDG No.: 36440-35
Test Name: Explosives
Method No.: 8330

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 °C, then flag L(+)/UL(-).			
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional judgement.			

Notes:

MS/MSD for 54MW-2 several %R outside QC
octahydro —— 60% / 181 %) Prev. flagged for LCS
2,4,6-trinitrotoluene RPD 44% > 30%. Pos → J,d in Parent
2,6-dinitrotoluene MSD and RPD > QC at 148% and 48%.
Parent pos → J,m

8.0 Field Duplicate		Yes	No	NA
8.1	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes:

See attached 54MW-10 and DUP-1

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes: RPD for several compds > 40% for several samples. pos → J,q unless prev. flagged.

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%$_{aq}$ and 90%$_{so}$)	✓		
10.1.1	Number of samples:			
10.1.2	Number of target compounds in each analysis: 14			
10.1.3	Number of results rejected or not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

LCS / LCS DUPLICATE RECOVERY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Water

SDG: 36440-35
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL
QC Batch: 0703431
Sequence: 7041011

Laboratory ID: 0703431-BS1

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	1.78	69	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	1.82	70	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	1.81	70	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	1.95	75	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	1.80	69	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	4.07	78	50 - 155	ug/L
2-Nitrotoluene	2.60	2.11	81	45 - 135	ug/L
3-Nitrotoluene	2.60	2.20	85	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	1.93	74	55 - 155	ug/L
4-Nitrotoluene	2.60	1.95	75	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.60	2.11	81	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	2.60	1.17	45	20 - 175	ug/L
Nitrobenzene	2.60	1.83	71	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	2.60	1.95	75 *	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

: 00038

LCS / LCS DUPLICATE RECOVERY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Water

Laboratory ID: 0703431-BS2

SDG: 36440-35
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL
QC Batch: 0703431
Sequence: 7041072

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	1.75	68	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	2.05	79	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	2.04	78	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	2.36	91	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	2.11	81	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	4.70	91	50 - 155	ug/L
2-Nitrotoluene	2.60	2.55	98	45 - 135	ug/L
3-Nitrotoluene	2.60	2.55	98	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	2.51	97	55 - 155	ug/L
4-Nitrotoluene	2.60	2.33	90	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.60	2.17	83	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	2.60	0.768	30	20 - 175	ug/L
Nitrobenzene	2.60	2.26	87	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	2.60	2.31	89	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

second LCS

all passed

: 00246

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

54MW-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Group, Inc.
Matrix: Water

SDG: 36440-35
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL

Laboratory ID: 0703431-MS1
QC Batch: 0703431

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	0.216	2.19	76	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	ND	1.96	75	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	0.250	2.23	76	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	ND	2.18	84	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	1.11	3.03	74	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	0.933	4.80	74	50 - 155	ug/L
2-Nitrotoluene	2.60	ND	2.26	87	45 - 135	ug/L
3-Nitrotoluene	2.60	ND	2.30	89	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	0.569	2.97	92	55 - 155	ug/L
4-Nitrotoluene	2.60	0.936	2.35	54	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.60	ND	2.34	90	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	ND	1.29	50	20 - 175	ug/L
Nitrobenzene	2.60	ND	1.91	73	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5	2.60	6.65	8.37	66 *	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8330

54MW-2

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Group, Inc.

Matrix: Water

SDG: 36440-35

Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Preparation: 8330 Extraction

Initial/Final: 770 mL / 10 mL

Laboratory ID: 0703431-MSD1

QC Batch: 0703431

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	2.40	84	9	30	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	2.05	79	5	30	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	3.50	125	44 *	30	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	2.30	89	5	30	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	4.94	148 *	48 *	30	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	6.28	103	27	30	50 - 155	ug/L
2-Nitrotoluene	2.60	2.34	90	4	30	45 - 135	ug/L
3-Nitrotoluene	2.60	2.67	103	15	30	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	3.58	116	19	30	55 - 155	ug/L
4-Nitrotoluene	2.60	2.77	71	16	30	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.60	2.17	84	8	30	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	1.24	48	4	30	20 - 175	ug/L
Nitrobenzene	2.60	2.06	79	8	30	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5	2.60	11.4	181 *	30	30	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

: 00037

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 54MW-8 LAB SAMPLE # 0703452-01

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Hydro-RO	E2Acclaim
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	4.94	4.69	5.09	11.94750	58.7%
HMX	2	7.93	7.82	8.12	6.52890	
RDX	1	8.15	7.79	8.45	8.05250	1.4%
RDX	2	11.92	11.64	12.10	7.93760	
1,3,5-Trinitrobenzene	1	11.10	10.65	11.47	4.62040	3.7%
1,3,5-Trinitrobenzene	2	12.56	12.27	12.69	4.45070	
2,4,6-Trinitrotoluene	1	19.46	18.69	20.07	13.87610	2.4%
2,4,6-Trinitrotoluene	2	21.10	20.28	21.52	13.54050	
4-Amino-2,6-Dinitrotol	1	21.42	20.58	22.06	2.32800	21.1%
4-Amino-2,6-Dinitrotol	2	34.42	32.96	35.04	2.87590	
2-Amino-4,6-Dinitrotol	1	22.62	21.69	23.35	2.60690	34.8%
2-Amino-4,6-Dinitrotol	2	36.85	35.35	37.51	3.70390	
4-Nitrotoluene	1	33.07	31.70	34.04	0.85340	47.6%
4-Nitrotoluene	2	30.93	29.02	30.64	1.38640	

00135

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: DUP-1 LAB SAMPLE # 0703452-02

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Hydro-RO	E2Acclaim
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	4.93	4.69	5.09	1.86790	13.1%
HMX	2	8.00	7.82	8.12	2.13060	
2,4-Dinitrotoluene	1	25.24	24.49	26.20	0.27490	65.3%
2,4-Dinitrotoluene	2	26.29	24.53	26.02	0.54150	

00136

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 54MW-10 LAB SAMPLE # 0703452-03

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Hydro-RO	E2Acclaim
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	4.94	4.69	5.09	10.19510	15.3%
HMX	2	8.01	7.82	8.12	8.74910	
RDX	1	8.17	7.79	8.45	7.71150	1.3%
RDX	2	11.98	11.64	12.10	7.61060	
1,3,5-Trinitrobenzene	1	11.13	10.65	11.47	3.90410	4.4%
1,3,5-Trinitrobenzene	2	12.64	12.27	12.69	3.73500	
2,4,6-Trinitrotoluene	1	19.46	18.69	20.07	12.21250	2.4%
2,4,6-Trinitrotoluene	2	21.20	20.28	21.52	11.91880	
4-Amino-2,6-Dinitrotol	1	21.43	20.58	22.06	2.09230	24.5%
4-Amino-2,6-Dinitrotol	2	34.58	32.96	35.04	2.67640	
2-Amino-4,6-Dinitrotol	1	22.63	21.69	23.35	2.35960	31.9%
2-Amino-4,6-Dinitrotol	2	36.93	35.35	37.51	3.25510	
2,6-Dinitrotoluene	1	24.74	23.82	25.44	1.39640	79.0%
2,6-Dinitrotoluene	2	25.22	29.02	30.64	0.60590	

00137

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 54MW-5 LAB SAMPLE # 0703467-02

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Hydro-RO	E2Acclaim
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	4.91	4.69	5.09	2.70460	11.7%
HMX	2	8.13	7.82	8.12	3.03930	
1,3,5-Trinitrobenzene	1	11.09	10.65	11.47	0.18950	12.4%
1,3,5-Trinitrobenzene	2	12.47	12.27	12.69	0.21460	
2,4,6-Trinitrotoluene	1	19.31	18.69	20.07	0.84010	75.1%
2,4,6-Trinitrotoluene	2	21.41	20.28	21.52	0.38140	
4-Amino-2,6-Dinitrotol	1	21.38	20.58	22.06	0.64960	55.9%
4-Amino-2,6-Dinitrotol	2	34.88	32.96	35.04	1.15300	
2-Amino-4,6-Dinitrotol	1	22.54	21.69	23.35	0.71210	15.6%
2-Amino-4,6-Dinitrotol	2	36.82	35.35	37.51	0.83260	
4-Nitrotoluene	1	33.03	31.70	34.04	0.63160	61.8%
4-Nitrotoluene	2	29.73	29.02	30.64	1.19700	
Nitrobenzene	1	17.64	16.96	18.20	0.29930	15.8%
Nitrobenzene	2	16.45	16.15	16.75	0.25550	

: 60148

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 54-MW-2 LAB SAMPLE # 0703467-03

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Hydro-RO	E2Acclaim
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	4.91	4.69	5.09	6.65040	26.1%
HMX	2	8.12	7.82	8.12	5.11280	
2,4,6-Trinitrotoluene	1	19.17	18.69	20.07	0.25020	8.4%
2,4,6-Trinitrotoluene	2	21.31	20.28	21.52	0.27210	
4-Amino-2,6-Dinitrotoluene	1	21.30	20.58	22.06	0.56910	73.1%
4-Amino-2,6-Dinitrotoluene	2	34.73	32.96	35.04	1.22440	
2-Amino-4,6-Dinitrotoluene	1	22.50	21.69	23.35	0.93320	40.3%
2-Amino-4,6-Dinitrotoluene	2	36.93	35.35	37.51	1.40350	
2,6-Dinitrotoluene	1	24.59	23.82	25.44	1.10740	73.0%
2,6-Dinitrotoluene	2	24.98	23.26	24.78	0.51540	

: 00141

SDG CASE NARRATIVE

URS Group, Inc.
Radford Army Ammunition Plant
Quarterly Groundwater Monitoring
SWMU 54

SDG – 36440-35
APRIL 23, 2007

This case narrative is applicable to aqueous samples collected from SWMU54 at Radford Army Ammunition Plant (the Site), Radford, Virginia by URS Group, Inc. (the Client) and received by TriMatrix Laboratories, Inc. (TriMatrix) on March 28 and March 29, 2007. The samples were assigned to TriMatrix project sample delivery group (SDG) 36440-35 for analytical services (the Project) to be performed according to:

a) Subcontract NCA-06-1783, URS Project No. 11656351.30013,

b) the Scope of Work (SOW) for the above,

c) Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006 (by reference)

d) any verbal and written correspondence between the Client and TriMatrix as the Project progressed.

No part of this Project was subcontracted.

Field Sample and Assigned Laboratory Sample ID Summary

For the samples received, a field sample to laboratory sample ID cross-reference table follows below and on the next page.

Field Sample Name	Sample Matrix	Laboratory Sample ID	Date Sampled	Date Received
54MW-8	Water	0703452-01	03/27/07	03/28/07
DUP-1	Water	0703452-02	03/27/07	03/28/07
54MW-10 Dup	Water	0703452-03	03/27/07	03/28/07
54MW-7	Water	0703452-04	03/27/07	03/28/07
54MW-9	Water	0703452-05	03/27/07	03/28/07
54MW-4	Water	0703452-06	03/27/07	03/28/07
54MW-6	Water	0703452-07	03/27/07	03/28/07
54MW-1	Water	0703467-01	03/28/07	03/29/07
54MW-5	Water	0703467-02	03/28/07	03/29/07
54MW-2	Water	0703467-03	03/28/07	03/29/07
54MW-3	Water	0703467-04	03/28/07	03/29/07
EB-1	Water	0703467-05	03/28/07	03/29/07

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Individual sample results relate only to the sample tested.

Sample Receipt and Log-in

There were two receipt events.

Receipt Event One

On March 28, 2007 at 09:10 hrs, two sample coolers containing multiple water samples were received at TriMatrix via FedEx (the carrier). The coolers had been shipped from the Site on March 27.

The external custody seal affixed to each cooler was intact. The samples were received on ice and in good condition. Given the absence of temperature blanks in the coolers, the receipt temperature of the interior of each cooler was estimated by averaging the measured temperatures of three randomly selected samples; the average temperatures, in °C, were 4.9 and 3.9.

Shipping documents included two field chains-of-custody form (COC) and associated carrier air bill.

No sample was designated by the Client for MS/MSD analysis.

Samples were assigned to Work Order 0703452 and SDG 36440-35.

Receipt Event Two

On March 29, 2007 at 09:00 hrs, one sample cooler containing multiple water samples was received at TriMatrix via FedEx (the carrier). The cooler had been shipped from the Site on March 28.

The external custody seal affixed to the cooler was intact. The samples were received on ice and in good condition. The receipt temperature of the interior of the cooler was measured via a 'temperature blank' shipped in it; the measured temperature, in °C, was 1.9.

Shipping documents included one field chain-of-custody form (COC) and associated carrier air bill.

Sample '54MW-2' was designated by the Client for MS/MSD analysis.

Samples were assigned to Work Order 0703467 and SDG 36440-35.

Both Events

Copies of all referenced receipt and custody documents are provided in Section A of this data package. Correspondence regarding completed sample log-in activities will be found in Attachment 1 of this narrative.

Provision of Sample Receipt Information to Client

A copy of the COCs and receipt checklist were transmitted to the Client within one day of sample receipt. The Client did not request any modification(s) to the analyses, as listed on the COC.

Post-Receipt Sample Custody

Custody of the sample during sample preparation (if applicable) and analysis was assigned to individual analysts. Copies of completed 'internal chain of custody' forms are included in Section A.

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Variances

Data Qualifier Flags

Data qualifier flags other than those listed in the DoD QSM were employed or the definition of an existing flag was modified.

J – Estimated: the analyte was detected at a concentration greater than the limit of detection (i.e., MDL) but less than the reporting limit (i.e., MRL).

B – Blank contamination: The analyte was detected above one-half the reporting limit in an associated method blank. The same analyte in the sample was detected at less than five times the method blank concentration. (If a common laboratory contaminant is present in the method blank at a concentration greater than one-half the reporting limit but less than or equal to that reporting limit, any associated sample results are flagged but corrective action is not necessarily taken. A text qualifier is also associated with such a result.)

E – Exceeds calibration range: The analyte response exceeded the calibrated range of the instrument. (With the exception of metals for which only the final non-qualified result is reported, both the initial E-qualified result and final non-qualified result from reanalysis-at-dilution are reported.)

Text Qualifier

A LIMS-generated text qualifier is substituted for many instances in which the DoD QSM "Q" flag would otherwise apply. The text qualifiers are listed in a summary format by parameter with applicable samples identified.

Analytical Methods

Sample preparation and analytical methods that were employed are per the SOW.

Method Detection Limits, Target Analytes, and Reporting Limits

All method detection limits (MDL) for analytes in this report are compliant with the DoD QSM specification that each reporting limit (RL) employed is to be at least three times the MDL. In addition, no RL is less than the equivalent concentration of the lowest instrument calibration standard. The target analyte list was specified by the Client. Proposed RLs were submitted by TriMatrix to the Client prior to the receipt of any samples.

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Project-specific Analytes of Concern

No project-specific analytes of concern were identified in the SOW, however, it is assumed that Method 8330 target analytes are of concern.

Quality Control Limits

Quality control limits specified in the DoD QSM were employed.

Hold Times

All samples were extracted/digested (where applicable) and analyzed within hold time.

Technical Issues

There were no general technical issues. Any issues unique to a particular parameter will be discussed in the QC section for it.

Sample Result Reporting Convention

Sample results are reported as RL 'U' (e.g., 0.001 U) if the target analyte was not detected above the MDL. If a sample for an organic parameter is reanalyzed and also reported, the second analysis includes the suffix 'REn' where n = the first, second, etc. reanalysis. If a sample for an organic parameter is reanalyzed for confirmation purposes and also reported, the second analysis includes the suffix 'RE1'.

Data Qualifier Designation

If applicable, a sample result is qualified with:

- a "U" flag if the analyte was not detected at a concentration greater than the MDL,
- a "B", "J", and/or an "E" flag as defined in the preceding Variance section,
- a LIMS-generated statement of qualification. Qualifying statements, if any, will be found in Attachment 2 to this narrative.

QC Batch and Analytical Batch Designation

A QC Batch is a seven digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation); it is limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.).

An Analytical Batch (or Sequence) is a seven digit number that associates all samples analyzed as a set under one analytical sequence.

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Quality Control Results – Nitroaromatic Explosives

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications for both the primary and confirmation columns were DoD QSM and method-compliant.

Method Blanks

No target analytes were detected.

Surrogates

All surrogate recoveries were in control for both the primary column and confirmation column runs.

Laboratory Control Samples

The Laboratory Control Samples (LCS) was fortified with all target analytes. All recoveries were in control for both the primary column and confirmation column runs with the exception of HMX (75%) on the primary column.

Matrix Spikes

Sample '54MW-2' was fortified with all target analytes. Most recoveries and RPDs on the primary and confirmation columns were in control; see the matrix spike summary forms and text qualifiers for details.

Sample Results

See Section B. Second-column analysis was needed for multiple samples due to tentative detections of one or more target analytes on the primary column. Of those samples where one or more analytes were confirmed, those confirmation analyses are identified by the laboratory sample ID plus an 'RE1' suffix. The confirmation analyses were performed at a different date and/or time and, for the two samples for which a tentative detection was confirmed, summary forms and raw data have been included following that for the primary column. Where an analyte was confirmed, both sets of sample results have been reported.

Corrective Actions

No corrective actions were taken.

Statements of Data Qualification

See Narrative Attachment 2.

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Data Review and Approval

All data was reviewed and approved by the group supervisor/manager prior to further review by the project chemist.

Data Deliverables

The data deliverables, both hardcopy and electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD has been issued separate from this hardcopy report.

Walt Roudebush, Project Chemist

4/23/07
Date

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Individual sample results relate only to the sample tested.

STATEMENT OF DATA QUALIFICATIONS

Nitroaromatics & Nitramines by EPA Method 8330

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-8330

Sample/Analyte:	
0703467-03 54MW-2	2,6-Dinitrotoluene
0703467-03 54MW-2	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
0703467-03RE1 54MW-2	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

Qualification: The RPD between the MS and MSD results exceeded the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-8330

Sample/Analyte:	
0703467-03 54MW-2	2,4,6-Trinitrotoluene
0703467-03 54MW-2	2,6-Dinitrotoluene
0703467-03RE1 54MW-2	2,4,6-Trinitrotoluene
0703467-03RE1 54MW-2	2-Nitrotoluene
0703467-03RE1 54MW-2	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

Qualification: The RPD between the detected values from the primary and confirmation analyses exceeded 40%. The higher concentration result has been reported.

Analysis: USEPA-8330

Sample/Analyte:	
0703452-01 54MW-8	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
0703452-01RE1 54MW-8	4-Nitrotoluene
0703452-02RE1 DUP-1	2,4-Dinitrotoluene
0703452-03 54MW-10	2,6-Dinitrotoluene
0703467-02 54MW-5	2,4,6-Trinitrotoluene
0703467-02RE1 54MW-5	4-Amino-2,6-dinitrotoluene
0703467-02RE1 54MW-5	4-Nitrotoluene
0703467-03 54MW-2	2,6-Dinitrotoluene
0703467-03RE1 54MW-2	2-Amino-4,6-dinitrotoluene
0703467-03RE1 54MW-2	4-Amino-2,6-dinitrotoluene

Qualification: The LCS recovery was outside of the control limit with no allowed marginal exceedances. The result for this analyte in any sample from the associated QC batch is considered qualified.

Analysis: USEPA-8330

0703431-BS1	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

: 60014

TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 117564

Page 1 of 1

For Lab Use Only
Cart: 7
VOA Rack/Tray: —
Receipt Log No.: 178
Project Chemist: WSR
Laboratory Project No.: E 0705452

Client Name: URS Corporation
Address: 5540 Falmouth St, Suite 201
Richmond VA 23230
Phone: 804-965-9000
Fax: 804-965-9764

Project Name: SWMU 54 - GWQ2
Client Project No. / P.O. No.: 11656351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Explosives

Container Type (corresponds to Container Packing List): 2
Number of Containers Submitted

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
1	01	WG	01	54MW-8 ✓		3/27/07	1330		✓		2		
2	02	WG	02	Dup-1 ✓			—		✓		2		
3	01	WG	03	54MW-10 ✓			1211		✓		2		
4	01	WG	04	54MW-7 ✓			1628		✓		2		
5													
6													
7													
8													
9													
10													

Sampled By (print): John Spangler
Sampler's Signature: [signature]
Company: URS

How Shipped? Hand Carrier: Fed Ex
Tracking No.: 856423270903

Comments

	Relinquished By	Date	Time	Received By	Date	Time
1	[signature]	3/29/07	1800	[signature]		
2						
3						

3. Received For Lab By: [signature] Date: 3/30/07 Time: 0910

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2

TriMatrix Laboratories, Inc.

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Chain of Custody Record

COC No. 117565

Page 1 of 1

For Lab Use Only
Cart: 7
VOA Rack/Tray: —
Receipt Log No.: 178
Project Chemist: WSR
Laboratory Project No.: E 070345 2

Client Name: URS Corporation
Address: 5540 Falmouth St, Suite 201
Richmond VA 23230
Phone: 804-965-9000
Fax: 804-965-9764

Project Name: SWMU54-GWQ2
Client Project No. / P.O. No.: 11656351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

	0										
	Explosives										
Container Type (corresponds to Container Packing List)	2										
Number of Containers Submitted											

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Total	Sample Comments
01	WG	05	1	54MW-9 ✓		3/27/07	1410		✓		2	
01	WG	06	2	54MW-4 ✓		↓	1555		✓		2	
01	WG	07	3	54MW-6 ✓		↓	1025		✓		2	
			4									
			5									
			6									
			7									
			8									
			9									
			10									

Sampled By (print): John Spangler
Sampler's Signature: [signature]
Company: URS

How Shipped? Hand Carrier FedEx
Tracking No.: 8564 2727 0888

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	3/27/07	1600						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						[signature]	3-28-07	0910

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TriMatrix Laboratories, Inc.

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Phone (616) 975-4500 Fax (616) 942-7463
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Chain of Custody Record

COC No. 116937

Page ____ of ____

For Lab Use Only

Cart: 2
VOA Rack/Tray:
Receipt Log No.: 19-5
Project Chemist:
Laboratory Project No.: E 07034107

Client Name: URS Corp.
Address: 5540 Falmouth St. Ste 201
Richmond VA 23230
Phone: 804-965-9000
Fax: 804-965-9264

Project Name: SWMU 54-GWQ2
Client Project No. / P.O. No.: 11655351
Invoice To: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Explosives

Container Type (corresponds to Container Packing List): A

Number of Containers Submitted: 2

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Total	Sample Comments
1	01	WG	01	54MW-1 ✓		3/28/07	955		✓	GW	2	
2	01	WG	02	54MW-5 ✓			1033		✓		2	
3	03	WG	03	54MW-2 ✓			1130		✓		2	
4				54MW-2MS/MSD			1130		✓		2	
5	01	WG	04	54MW-3 ✓			1221		✓		2	
6	04	WQ	05	EB-1 ✓			1245		✓		2	
7												
8												
9												
10												

Sampled By (print): John Spangler
Sampler's Signature: JSpangler
Company: URS

How Shipped? Hand Carrier: Fed Ex
Tracking No.: 8564 2327 0925

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	3/28/07	1500						

1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Kim Ziegler	3/29/07	900

TriMatrixCOC -- COC

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination	n	Failed Signal to noise ratio		

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-38 **Fraction:** Explosives

Lab: TriMatrix **Project Name** Radford SWMU 54

Reviewer: RA **Date:** July 2, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The continuing calibration analyzed on 6/13/07 at 0245 displayed a percent difference (%D) greater than the control limit of 15% with a negative bias for tetryl at 18.0%. The continuing calibration analyzed on 6/13/07 at 0740 displayed %Ds greater than the control limit with a negative bias for tetryl at 19.20% and 2,6-dinitrotoluene at 16.3%. The associated field sample results were non-detects and were flagged "UJ,c".

The matrix spike pair analyzed for sample 54MW-2 displayed percent recoveries greater than the upper control limits for 2,6-dinitrotoluene (169%/169%) and 4-nitrotoluene (150%). This matrix spike pair also displayed a relative percent difference (RPD) greater than the control limit for 2-nitrotoluene at 43%. The associated parent sample results were non-detects and no data qualifying action was necessary.

The RPDs between the two analytical columns were greater than the control limit of 40% for 4-amino-2,6-dinitrotoluene in sample 54MW-5 at 41.4%, 1,3,5-trinitrobenzene in sample 54MW-3 at 53.1%, and HMX in sample 54MW-2 at 59.8%. These results were flagged "J,g" in these samples.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Rayan

SAMPLE ID SUMMARY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-38

Client: URS Corporation

Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Client Sample Id:	Lab Sample Id:
54MW-5	0706134-01
54MW-5	0706134-01RE1
54MW-9	0706134-02
54MW-9	0706134-02RE1
54MW-3	0706134-03
54MW-3	0706134-03RE1
Eq Blank	0706134-04
DUP-1	0706134-05
DUP-1	0706134-05RE1
54MW-6	0706134-06
54MW-10	0706134-07
54MW-10	0706134-07RE1
54MW-8	0706134-08
54MW-8	0706134-08RE1
54MW-1	0706134-09
54MW-2	0706134-10
54MW-2	0706134-10RE1
54MW-4	0706134-11
54MW-7	0706134-12
54MW-7	0706134-12RE1

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-38 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0706134-01 File ID: data013-0

Sampled: 06/05/07 16:40 Prepared: 06/11/07 07:51 Analyzed: 06/12/07 21:07

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0706364 Sequence: 7061815 Calibration: 7F14010 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	0.49	5.0	0.10	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.43	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.82	5.0	0.22	J J,B
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ,C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	6.0	5.0	0.20	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.86	75	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-9

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-38 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0706134-02 File ID: data014-0

Sampled: 06/05/07 14:35 Prepared: 06/11/07 07:51 Analyzed: 06/12/07 21:50

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0706364 Sequence: 7061815 Calibration: 7F14010 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	0.42	5.0	0.16	J
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ, C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	4.1	5.0	0.20	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.41	68	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-38 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0706134-03 File ID: data015-0

Sampled: 06/05/07 17:30 Prepared: 06/11/07 07:51 Analyzed: 06/12/07 22:32

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0706364 Sequence: 7061815 Calibration: 7F14010 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.28	5.0	0.045	J J,J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	1.0	5.0	0.10	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.83	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	1.3	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	1.0	5.0	0.49	J
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ,C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	15	5.0	0.20	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.87	75	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

Eq Blank

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-38 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Water Laboratory ID: 0706134-04 File ID: data016-0

Sampled: 06/05/07 11:20 Prepared: 06/11/07 07:51 Analyzed: 06/12/07 23:14

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0706364 Sequence: 7061815 Calibration: 7F14010 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ, C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	5.07	78	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-38 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0706134-05 File ID: data017-0

Sampled: 06/05/07 00:00 Prepared: 06/11/07 07:51 Analyzed: 06/12/07 23:56

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0706364 Sequence: 7061815 Calibration: 7F14010 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.16	5.0	0.045	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ, C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.56	70	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-6

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

SDG: 36440-38 4MD

Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water

Laboratory ID: 0706134-06

File ID: data018-0

Sampled: 06/05/07 10:55

Prepared: 06/11/07 07:51

Analyzed: 06/13/07 00:38

Solids:

Preparation: 8330 Extraction

Initial/Final: 770 mL / 10 mL

QC Batch: 0706364

Sequence: 7061815

Calibration: 7F14010

Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ/C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.58	70	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-10

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-38 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0706134-07 File ID: data019-0

Sampled: 06/05/07 15:50 Prepared: 06/11/07 07:51 Analyzed: 06/13/07 01:20

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0706364 Sequence: 7061815 Calibration: 7F14010 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.75	5.0	0.045	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	2.4	5.0	0.10	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	1.6	5.0	0.092	J
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ,C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.68	72	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-8

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-38 4MD
Client: URS Corporation
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Matrix: Ground Water
Laboratory ID: 0706134-08
File ID: data020-0
Sampled: 06/05/07 14:13
Prepared: 06/11/07 07:51
Analyzed: 06/13/07 02:02
Solids:
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL
QC Batch: 0706364
Sequence: 7061815
Calibration: 7F14010
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ,C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	6.3	5.0	0.20	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.90	76	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-38 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0706134-09 File ID: data022-0

Sampled: 06/05/07 19:29 Prepared: 06/11/07 07:51 Analyzed: 06/13/07 03:27

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0706364 Sequence: 7061815 Calibration: 7F14010 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U UJ,C
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ,C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.76	73	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-38 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0706134-10 File ID: data023-0

Sampled: 06/05/07 17:10 Prepared: 06/11/07 07:51 Analyzed: 06/13/07 04:09

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0706364 Sequence: 7061815 Calibration: 7F14010 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.9	5.0	0.045	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	3.9	5.0	0.10	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U UJ, C
35572-78-2	2-Amino-4,6-dinitrotoluene	1	4.1	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.2	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ, C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	30	5.0	0.20	J, 8

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	5.53	85	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-38 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0706134-11 File ID: data024-0

Sampled: 06/05/07 12:18 Prepared: 06/11/07 07:51 Analyzed: 06/13/07 04:51

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0706364 Sequence: 7061815 Calibration: 7F14010 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U UJ, C
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ, C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.88	60	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW-7

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-38 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0706134-12 File ID: data025-0

Sampled: 06/05/07 12:37 Prepared: 06/11/07 07:51 Analyzed: 06/13/07 05:33

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0706364 Sequence: 7061815 Calibration: 7F14010 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U UJ, C
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U UJ, C
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	3.2	5.0	0.20	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.71	73	29 - 138	

* Values outside of QC limits

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 7/26/07
DV Level: II (III) IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
_X__ SW-846
_X__ Project QAPP/SAP

Project Name: SWMU54
Project Number: 116560351.30005
Laboratory: Tri Matrix
SDG No.: 36440-38
Test Name: Explosives
Method No.: 8330

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 ^{O}C, then flag L(+)/UL(-).			
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve? If no, flag "R".	✓		
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".			
4.3	Were continuing calibration standards analyzed every 12 hours or twenty samples? If no, flag "R".			
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±15%) or %D(≤15%) within the		✓	
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>15%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 15%, J(+), only. Negative Bias - %D>-15% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes:

CCV 6113107 0245 tetryl %D 18.0% neg bias

CCV 6113107 0740 tetryl %D 19.2% neg bias, 2/6-DNT 16.3% neg bias also.

All NDs, UJ/C in 8 samples.

5.0 Laboratory Control Sample (LCS)		Yes	No	NA
5.1	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.2	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
5.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.			✓

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			
6.2	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			✓
6.3	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			✓

	<10%	low	high
Positives	L	L	K
Non-detects	R	UL	No action

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional judgement.			

Notes:

The MS/MSD for 54MW-2 7QC for
2,6-Dinitrotoluene 169%/169%. all NDs in Parent,
RPD>30%. for 2-nitrotoluene at 43%.
MSD for 4-nitrotoluene >130%. at 150%. No action ✓

8.0 Field Duplicate		Yes	No	NA
8.1	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: DUP-1 54MW-4 RL
1,3,5-Trinitrobenzene 0.16 ND 5 OK ✓

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes: The RPDs >40% for several compds in several samples. → J/g.

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 95%$_{aq}$ and 90%$_{so}$)	✓		
10.1.1	Number of samples:			
10.1.2	Number of target compounds in each analysis: 14			
10.1.3	Number of results rejected or not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%.			

Notes:

SDG CASE NARRATIVE

URS Group, Inc.
Radford Army Ammunition Plant
Quarterly Groundwater Monitoring
SWMU 54

SDG – 36440-38
JUNE 28, 2007

This case narrative is applicable to aqueous samples collected from SWMU54 at Radford Army Ammunition Plant (the Site), Radford, Virginia by URS Group, Inc. (the Client) and received by TriMatrix Laboratories, Inc. (TriMatrix) on June 7, 2007. The samples were assigned to TriMatrix project sample delivery group (SDG) 36440-38 for analytical services (the Project) to be performed according to:

a) Subcontract NCA-06-1783, URS Project No. 11656351.30013,

b) the Scope of Work (SOW) for the above,

c) Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006 (by reference)

d) any verbal and written correspondence between the Client and TriMatrix as the Project progressed.

No part of this Project was subcontracted.

Field Sample and Assigned Laboratory Sample ID Summary

For the samples received, a field sample to laboratory sample ID cross-reference table follows below and on the next page.

Field Sample Name	Sample Matrix	Laboratory Sample ID	Date Sampled	Date Received
54MW-5	Water	0706134-01	06/05/07	06/07/07
54MW-9	Water	0706134-02	06/05/07	06/07/07
54MW-3	Water	0706134-03	06/05/07	06/07/07
Eq Blank	Water	0706134-04	06/05/07	06/07/07
DUP-1	Water	0706134-05	06/05/07	06/07/07
54MW-6	Water	0706134-06	06/05/07	06/07/07
54MW-10	Water	0706134-07	06/05/07	06/07/07
54MW-8	Water	0706134-08	06/05/07	06/07/07
54MW-1	Water	0706134-09	06/05/07	06/07/07
54MW-2	Water	0706134-10	06/05/07	06/07/07
54MW-4	Water	0706134-11	06/05/07	06/07/07
54MW-7	Water	0706134-12	06/05/07	06/07/07

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Individual sample results relate only to the sample tested.

Sample Receipt and Log-in

On June 7, 2007 at 09:00 hrs, three sample coolers containing multiple water samples were received at TriMatrix via FedEx (the carrier). The coolers had been shipped from the Site on June 6.

The external custody seal affixed to each cooler was intact. The samples were received on ice and in good condition. The receipt temperature of the interior of each cooler was measured via a 'temperature blank' shipped in it; the measured temperatures, in °C, were 1.5, 0.7, and 1.0. No sample was received frozen.

Shipping documents included three field chains-of-custody form (COC) and associated carrier air bills.

Sample 54MW-2 was designated by the Client for MS/MSD analysis.

Samples were assigned to Work Order 0706134 and SDG 36440-38.

Copies of all referenced receipt and custody documents are provided in Section A of this data package. Correspondence regarding completed sample log-in activities will be found in Attachment 1 of this narrative.

Provision of Sample Receipt Information to Client

A copy of the COCs and receipt checklist were transmitted to the Client within one day of sample receipt. The Client did not request any modification(s) to the analyses, as listed on the COC.

Post-Receipt Sample Custody

Custody of the sample during sample preparation (if applicable) and analysis was assigned to individual analysts. Copies of completed 'internal chain of custody' forms are included in Section A.

Due to the loss of the equipment blank sample, collected by the Client for dioxin/furan analysis, during shipment to SGS/Paradigm Laboratories that URS had retained for that analysis, the Client requested that one of two containers received at TriMatrix for sample 'Eq Blank' be shipped to that laboratory. That sample was shipped on June 11, 2007 for delivery the next day; no confirmation of receipt was received by TriMatrix.

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Variances

Data Qualifier Flags

Data qualifier flags other than those listed in the DoD QSM were employed or the definition of an existing flag was modified.

J – Estimated: the analyte was detected at a concentration greater than the limit of detection (i.e., MDL) but less than the reporting limit (i.e., MRL).

B – Blank contamination: The analyte was detected above one-half the reporting limit in an associated method blank. The same analyte in the sample was detected at less than five times the method blank concentration. (If a common laboratory contaminant is present in the method blank at a concentration greater than one-half the reporting limit but less than or equal to that reporting limit, any associated sample results are flagged but corrective action is not necessarily taken. A text qualifier is also associated with such a result.)

E – Exceeds calibration range: The analyte response exceeded the calibrated range of the instrument. (With the exception of metals for which only the final non-qualified result is reported, both the initial E-qualified result and final non-qualified result from reanalysis-at-dilution are reported.)

Text Qualifier

A LIMS-generated text qualifier is substituted for many instances in which the DoD QSM "Q" flag would otherwise apply. The text qualifiers are listed in a summary format by parameter with applicable samples identified.

Analytical Methods

Sample preparation and analytical methods that were employed are per the SOW.

Method Detection Limits, Target Analytes, and Reporting Limits

All method detection limits (MDL) for analytes in this report are compliant with the DoD QSM specification that each reporting limit (RL) employed is to be at least three times the MDL. In addition, no RL is less than the equivalent concentration of the lowest instrument calibration standard. The target analyte list was specified by the Client. Proposed RLs were submitted by TriMatrix to the Client prior to the receipt of any samples.

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Project-specific Analytes of Concern

No project-specific analytes of concern were identified in the SOW, however, it is assumed that Method 8330 target analytes are of concern.

Quality Control Limits

Quality control limits specified in the DoD QSM were employed.

Hold Times

All samples were extracted/digested (where applicable) and analyzed within hold time.

Technical Issues

There were no general technical issues. Any issues unique to a particular parameter will be discussed in the QC section for it.

Sample Result Reporting Convention

Sample results are reported as RL 'U' (e.g., 0.001 U) if the target analyte was not detected above the MDL. If a sample for an organic parameter is reanalyzed and also reported, the second analysis includes the suffix 'REn' where n = the first, second, etc. reanalysis. If a sample is reanalyzed for confirmation purposes, is confirmed, and also reported, the second analysis includes the suffix 'RE1'. If the confirmation was not performed simultaneously, the second set of sample results is reported on a second Form 1 since that confirmation analysis did not occur at the same time and/or date.

Data Qualifier Designation

If applicable, a sample result is qualified with:

- a "U" flag if the analyte was not detected at a concentration greater than the MDL,
- a "B", "J", and/or an "E" flag as defined in the preceding Variance section,
- a LIMS-generated statement of qualification. Qualifying statements, if any, will be found in Attachment 2 to this narrative.

QC Batch and Analytical Batch Designation

A QC Batch is a seven digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation); it is limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.).

An Analytical Batch (or Sequence) is a seven digit number that associates all samples analyzed as a set under one analytical sequence.

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Quality Control Results – Nitroaromatic Explosives

Note: data for second column confirmation analysis follows that provided for primary column analysis.

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications for both the primary and confirmation columns were DoD QSM and method-compliant.

Method Blank

No target analytes were detected.

Surrogates

All surrogate recoveries were in control for both the primary column and confirmation column runs.

Laboratory Control Sample

The Laboratory Control Sample (LCS) was fortified with all target analytes. All recoveries were in control for both the primary column and confirmation columns.

Matrix Spikes

Sample '54MW-2' was fortified with all target analytes. Most recoveries and RPDs on the primary and confirmation columns were in control; see the matrix spike summary forms and text qualifiers for details.

Sample Results

See Section B. Second-column analysis was needed for multiple samples due to tentative detections of one or more target analytes on the primary column. Of those samples where one or more analytes were confirmed, those confirmation analyses are identified by the laboratory sample ID plus an 'RE1' suffix. The confirmation analyses were performed at a different date and/or time and, for the samples for which a tentative detection was confirmed, summary forms and raw data have been included following that for the primary column. Where an analyte was confirmed, both sets of sample results have been reported.

Corrective Actions

No corrective actions were deemed necessary.

Statements of Data Qualification

See Narrative Attachment 2.

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Data Review and Approval

All data was reviewed and approved by the group supervisor/manager prior to further review by the project chemist.

Data Deliverables

The data deliverables, both hardcopy and electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD has been issued separate from this hardcopy report.

Walt Roudebush, Project Chemist

6/28/07
Date

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Individual sample results relate only to the sample tested.

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 7061815

SDG: 36440-38
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Instrument: 221
Calibration: 7F14010

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Instrument Blank	7061815-IBL1	data001-0	06/12/07 10:20
Initial Cal Check	7061815-ICV1	data010-0	06/12/07 19:01
Blank	0706364-BLK1	data011-0	06/12/07 19:43
LCS	0706364-BS1	data012-0	06/12/07 20:25
54MW-5	0706134-01	data013-0	06/12/07 21:07
54MW-9	0706134-02	data014-0	06/12/07 21:50
54MW-3	0706134-03	data015-0	06/12/07 22:32
Eq Blank	0706134-04	data016-0	06/12/07 23:14
DUP-1	0706134-05	data017-0	06/12/07 23:56
54MW-6	0706134-06	data018-0	06/13/07 00:38
54MW-10	0706134-07	data019-0	06/13/07 01:20
54MW-8	0706134-08	data020-0	06/13/07 02:02
Calibration Check	7061815-CCV1	data021-0	06/13/07 02:45
54MW-1	0706134-09	data022-0	06/13/07 03:27
54MW-2	0706134-10	data023-0	06/13/07 04:09
54MW-4	0706134-11	data024-0	06/13/07 04:51
54MW-7	0706134-12	data025-0	06/13/07 05:33
54MW-2	0706364-MS1	data026-0	06/13/07 06:15
54MW-2	0706364-MSD1	data027-0	06/13/07 06:57
Calibration Check	7061815-CCV2	data028-0	06/13/07 07:40

CONTINUING CALIBRATION CHECK
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-38
Client: URS Corporation
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Instrument ID: 221
Calibration: 7F14010
Lab File ID: data021-0
Calibration Date: 06/12/07 20:20
Sequence: 7061815
Injection Date: 06/13/07
Lab Sample ID: 7061815-CCV1
Injection Time: 02:45

Analyte	Type	CONC. (ug/L)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3,5-Trinitrobenzene	A	400	385	15.21188	14.6431		-3.7	20
1,3-Dinitrobenzene	A	400	418	16.14124	16.8708		4.5	20
2,4,6-Trinitrotoluene	A	400	385	9.658221	9.28738		-3.8	20
2,4-Dinitrotoluene	A	400	384	10.07162	9.66478		-4.0	20
2,6-Dinitrotoluene	A	400	385	7.094483	7.07338		-0.3	20
2-Amino-4,6-dinitrotoluene	A	400	394	7.775585	7.65888		-1.5	20
2-Nitrotoluene	Q	400	371	4.465343	3.61603		-7.3	20
3-Nitrotoluene	Q	400	386	4.15143	3.47608		-3.6	20
4-Amino-2,6-dinitrotoluene	A	400	376	5.964999	5.60555		-6.0	20
4-Nitrotoluene	Q	400	410	3.673519	3.19753		2.6	20
Hexahydro-1,3,5-trinitro-1,3,5-tri	A	400	431	8.224411	8.85198		7.6	20
Methyl-2,4,6-trinitrophenylnitrami	A	400	328	9.013626	7.3956		-18.0	20
Nitrobenzene	A	400	386	9.66412	9.33573		-3.4	20
Octahydro-1,3,5,7-tetranitro-1,3,5	A	400	412	10.35914	10.6642		2.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

neg bias

: 00108

CONTINUING CALIBRATION CHECK
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-38
Client: URS Corporation
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Instrument ID: 221
Calibration: 7F14010
Lab File ID: data028-0
Calibration Date: 06/12/07 20:20
Sequence: 7061815
Injection Date: 06/13/07
Lab Sample ID: 7061815-CCV2
Injection Time: 07:40

Analyte	Type	CONC. (ug/L)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3,5-Trinitrobenzene	A	400	390	15.21188	14.8141		-2.6	20
1,3-Dinitrobenzene	A	400	413	16.14124	16.6519		3.2	20
2,4,6-Trinitrotoluene	A	400	393	9.658221	9.4821		-1.8	20
2,4-Dinitrotoluene	A	400	390	10.07162	9.81003		-2.6	20
2,6-Dinitrotoluene	A	400	323	7.094483	5.93935		-16.3	20
2-Amino-4,6-dinitrotoluene	A	400	401	7.775585	7.8045		0.4	20
2-Nitrotoluene	Q	400	419	4.465343	4.0093		4.7	20
3-Nitrotoluene	Q	400	358	4.15143	3.26435		-10.6	20
4-Amino-2,6-dinitrotoluene	A	400	383	5.964999	5.7112		-4.3	20
4-Nitrotoluene	Q	400	421	3.673519	3.27315		5.3	20
Hexahydro-1,3,5-trinitro-1,3,5-tri	A	400	418	8.224411	8.59788		4.5	20
Methyl-2,4,6-trinitrophenylnitrami	A	400	323	9.013626	7.27908		-19.2	20
Nitrobenzene	A	400	387	9.66412	9.3489		-3.3	20
Octahydro-1,3,5,7-tetranitro-1,3,5	A	400	404	10.35914	10.474		1.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

neg bias

: 00111

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

54MW-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

SDG: 36440-38
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL

Laboratory ID: 0706364-MS1
QC Batch: 0706364

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	2.94	5.36	93	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	ND	2.36	91	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	3.86	6.51	102	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	ND	2.53	97	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	ND	4.39	169 *	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	4.13	9.40	101	50 - 155	ug/L
2-Nitrotoluene	2.60	ND	1.95	75	45 - 135	ug/L
3-Nitrotoluene	2.60	ND	2.50	96	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	2.22	5.26	117	55 - 155	ug/L
4-Nitrotoluene	2.60	ND	3.33	128	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tri	2.60	ND	3.03	117	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	ND	2.20	85	20 - 175	ug/L
Nitrobenzene	2.60	ND	2.21	85	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5	2.60	29.5	39.2	371 *	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

OK sample 7 4x spike

00033

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

54MW-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

SDG: 36440-38
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL

Laboratory ID: 0706364-MSD1
QC Batch: 0706364

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	5.79	110	8	30	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	2.34	90	0.9	30	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	6.57	104	0.9	30	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	2.65	102	5	30	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	4.38	169 *	0.2	30	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	9.40	101	0.008	30	50 - 155	ug/L
2-Nitrotoluene	2.60	3.01	116	43 *	30	45 - 135	ug/L
3-Nitrotoluene	2.60	2.55	98	2	30	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	4.96	106	6	30	55 - 155	ug/L
4-Nitrotoluene	2.60	3.90	150 *	16	30	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.60	2.61	101	15	30	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	2.19	84	0.7	30	20 - 175	ug/L
Nitrobenzene	2.60	2.13	82	4	30	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5	2.60	38.2	336 *	2	30	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

6K1 Sample 7 4X Spike

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 54MW-5 LAB SAMPLE # 0706134-01

54MW-5

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Hydro-RP	Acclaim E2
ID(mm):	4.6	4.6

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	4.16	3.88	4.28	6.02310	15.3%
	2	7.57	7.39	7.69	5.16580	
2,4,6-Trinitrotoluene	1	16.48	15.60	16.98	0.48870	16.4%
	2	20.34	19.73	20.97	0.41480	
4-Amino-2,6-Dinitrotol	1	17.71	16.92	18.40	0.81520	41.4%
	2	32.32	31.42	33.50	0.53540	
2-Amino-4,6-Dinitrotol	1	18.60	17.72	19.38	0.43490	3.5%
	2	34.54	33.51	35.67	0.45030	

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 54MW-3 LAB SAMPLE # 0706134-03

54MW-3

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Hydro-RP	Acclaim E2
ID(mm):	4.6	4.6

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	4.17	3.88	4.28	15.39060	21.4%
	2	7.56	7.39	7.69	12.41720	
1,3,5-Trinitrobenzene	1	9.47	8.91	9.73	0.28260	53.1%
	2	12.14	11.95	12.37	0.16400	
2,4,6-Trinitrotoluene	1	16.41	15.60	16.98	1.03600	2.2%
	2	20.28	19.73	20.97	1.01380	
4-Amino-2,6-Dinitrotol	1	17.74	16.92	18.40	1.26320	15.2%
	2	32.21	31.42	33.50	1.08430	
2-Amino-4,6-Dinitrotol	1	18.69	17.72	19.38	0.82840	2.6%
	2	34.47	33.51	35.67	0.85030	
4-Nitrotoluene	1	27.39	26.31	28.65	1.01140	5.8%
	2	29.04	28.15	29.77	0.95470	

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 54MW-2 LAB SAMPLE # 0706134-10

54MW-2

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Hydro-RP	Acclaim E2
ID(mm):	4.6	4.6

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	4.16	3.88	4.28	29.52260	59.8%
	2	7.61	7.40	7.70	15.93890	
1,3,5-Trinitrobenzene	1	9.44	8.91	9.73	2.94420	13.2%
	2	12.23	11.93	12.35	2.57870	
2,4,6-Trinitrotoluene	1	16.45	15.60	16.98	3.85720	6.4%
	2	20.37	19.63	20.87	3.61970	
4-Amino-2,6-Dinitrotol	1	17.80	16.92	18.40	2.21640	8.7%
	2	32.55	31.29	33.37	2.03090	
2-Amino-4,6-Dinitrotol	1	18.66	17.72	19.38	4.13330	11.4%
	2	34.75	33.45	35.61	3.68750	

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE, Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 119374 (1)

Page 1 of 1 (2)

For Lab Use Only
Cart: 12
VOA Rack/Tray: —
Receipt Log No.: 35114
Project Chemist: WSR
Laboratory Project No.: E 07C0134

Client Name: URS Corporation	Project Name: SWMU54
Address: 5540 Falmouth St, Ste 201 Richmond VA 23233	Client Project No./P.O. No.: 11605351
Phone: 804-965-9000 Fax: 804-965-9764	Invoice No. ☒ Client ☐ Other (comments)
	Contact/Report To: Roshanak Aryan

Analyses Requested

A: Explosives

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List): 2 — Number of Containers Submitted	Total	Sample Comments
01	WG	01	1	54MW-5 ✓	TM1403	6/6/07	1640		X	GW	2	2	
01	WG	02	2	54MW-9 ✓			1435		X		2	2	
01	WG	03	3	54MW-3 ✓			1730		X		2	2	
04	WQ	04	4	Eq Blank ✓			1120		X	W	2	2	
			5										
			6										
			7										
			8										
			9										
			10										

Sampled By (print): Tina DeVivo
Sampler's Signature:
Company: URS Corporation

How Shipped? Hand Carrier: fedex
Tracking No.:

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
Tina DeVivo	6/6/07	13:30						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Willie Cole	6/7/07	09

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TriMatrix Laboratories, Inc.

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Chain of Custody Record

COC No. 119373 (2)

Page 1 of 1

For Lab Use Only
Cart: 6
VOA Rack/Tray:
Receipt Log No.: 3514
Project Chemist: WSR
Laboratory Project No.: E07C6134

Client Name: URS Corporation
Address: 5540 Falmouth St, Ste 201
Richmond VA 23230
Phone: 804-965-
Fax: 804-965

Project Name: SWMU54
Client Project No./P.O. No.: 11656351
Invoice No.: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Preservatives: A

Container Type (corresponds to Container Packing List): 2

PRESERVATIVES
A NONE pH~6
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
02	WG	05	1	DUP1 ✓	NA	6/5/07	—		X	GW	2	2	
01	WG	02	2	54MW-6			10:55		X		2	2	
01	WG	07	3	54MW-10 ✓			15:50		X		2	2	
01	WG	08	4	54MW-8 ✓			14:13		X		2	2	
01	WG	09	5	~~54MW~~ 54MW-1 ✓			19:29		X		2	2	
			6										
			7										
			8										
			9										
			10										

Sampled By (print): Tina DeVine
Sampler's Signature:
Company: URS Corporation

How Shipped? Hand Carrier: fedex
Tracking No.:

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
Tina DeVine	6/6/07	13:30						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Willie Lobo	6/7/07	0900

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TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE, Grand Rapids, MI 49512
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Chain of Custody Record

COC No. 119372 (3)

Page 1 of 1

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Cart: Co
VOA Rack/Tray: —
Receipt Log No.: 3514
Project Chemist: WSR
Laboratory Project No.: E 07C0134

Client Name	Project Name
URS Corporation	SWMU54 GW-Q3
Address: 5540 Falmouth Street, Suite 201, Richmond, VA 23230	Client Project No./P.O. No.: 11656351
Phone: 804-965-9000	Invoice No. ☒ Client ☐ Other (comments)
Fax: 804-965-9764	Contact/Report To: Roshanak Aryan

Analyses Requested

Explosives

Container Type (corresponds to Container Packing List): 2

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
1	08	WG	10	54MW-2 ✓	TM1274	6/5/07	17:10		X	GW	2	2	
2				54MW-2 MS			17:10		X		2	2	
3				54MW-2 MSD			17:10		X		2	2	
4	01	WG	11	54MW-4 ✓			12:18		X		2	2	
5	01	WG	12	54MW-7 ✓			12:37		X		2	2	
6													
7													
8													
9													
10													

Sampled By (print): Tina DeVine
Sampler's Signature: TDV
Company: URS Corp

How Shipped? Hand Carrier Fedex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
Tina DeVine	6/6/07	1330						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						[illegible]	6/7/07	0900

TriMatrixCOC -- COC WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-41 **Fraction:** Explosives

Lab: TriMatrix **Project Name** Radford SWMU 54

Reviewer: RA **Date:** October 18, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The matrix spike pair analyzed for sample 54MW2 displayed percent recoveries less than the lower control limit of 80% for HMX at 30% and 19%, respectively. The associated parent sample result was positive and was flagged "J,m".

The relative percent differences (RPDs) between the two analytical columns were greater than the control limit of 40% for 2-nitrotoluene in sample 54MW2 at 81.6%, 2,4,6-trinitroluene in sample 54MW5 at 41.8%, and HMX in sample 54MW7 at 45.2%. These results were flagged "J,g" in these samples. The higher results should be used for data interpretation purposes.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: R ayan

SDG CASE NARRATIVE

URS Group, Inc.
Radford Army Ammunition Plant
Quarterly Groundwater Monitoring
SWMU 54

SDG – 36440-41
OCTOBER 16, 2007

This case narrative is applicable to aqueous samples collected from SWMU54 at Radford Army Ammunition Plant (the Site), Radford, Virginia by URS Group, Inc. (the Client) and received by TriMatrix Laboratories, Inc. (TriMatrix) on September 21, 2007. The samples were assigned to TriMatrix project sample delivery group (SDG) 36440-41 for analytical services (the Project) to be performed according to:

a) Subcontract NCA-06-1783, URS Project No. 11656351.30013,

b) the Scope of Work (SOW) for the above,

c) Department of Defense Quality Systems Manual for Environmental Laboratories, Final Version 3, January 2006 (by reference)

d) any verbal and written correspondence between the Client and TriMatrix as the Project progressed.

No part of this Project was subcontracted.

Field Sample and Assigned Laboratory Sample ID Summary

For the samples received, a field sample to laboratory sample ID cross-reference table follows below and on the next page.

Field Sample Name	Sample Matrix	Laboratory Sample ID	Date Sampled	Date Received
54MW9	Water	0709448-01	09/18/07	09/21/07
54MW8	Water	0709448-02	09/18/07	09/21/07
54MW10	Water	0709448-03	09/18/07	09/21/07
54MW3	Water	0709448-04	09/19/07	09/21/07
54MW2	Water	0709448-05	09/19/07	09/21/07
54MW5	Water	0709448-06	09/19/07	09/21/07
54MW7	Water	0709448-07	09/19/07	09/21/07
DUP-1	Water	0709448-08	09/19/07	09/21/07
54MW4	Water	0709448-09	09/19/07	09/21/07
54MW1	Water	0709448-10	09/19/07	09/21/07
54MW6	Water	0709448-11	09/19/07	09/21/07
EQBK-1	Water	0709448-12	09/19/07	09/21/07

This report shall not be reproduced except in full, without written authorization of TriMatrix Laboratories, Inc.
Individual sample results relate only to the sample tested.

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW9

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-01 File ID: data005-20071009-211547-0

Sampled: 09/18/07 14:05 Prepared: 09/24/07 07:21 Analyzed: 10/09/07 21:15

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.26	66	29 - 138	

* Values outside of QC limits

00038

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW8

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-02 File ID: data006-0

Sampled: 09/18/07 15:30 Prepared: 09/24/07 07:21 Analyzed: 10/09/07 22:02

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.42	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	6.6	5.0	0.20	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.15	64	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW10

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-03 File ID: data007-0

Sampled: 09/18/07 16:40 Prepared: 09/24/07 07:21 Analyzed: 10/09/07 22:49

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	6.5	5.0	0.045	
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	17	5.0	0.10	
121-14-2	2,4-Dinitrotoluene	1	0.65	5.0	0.092	J
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.2	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	1.8	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	8.0	5.0	0.092	
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.8	5.0	0.20	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.84	59	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW3

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-04 File ID: data008-0

Sampled: 09/19/07 09:18 Prepared: 09/24/07 07:21 Analyzed: 10/09/07 23:37

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.17	5.0	0.045	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	1.2	5.0	0.10	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.76	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.88	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	10	5.0	0.20	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	7.54	116	29 - 138	

* Values outside of QC limits

: 00047

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW2

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-05 File ID: data009-0

Sampled: 09/19/07 10:37 Prepared: 09/24/07 07:21 Analyzed: 10/10/07 00:24

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.65	5.0	0.045	J
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	0.78	5.0	0.10	J
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	1.0	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	~~0.34~~ 0.82 BA	5.0	0.28	J JJ
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.69	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	8.2	5.0	0.20	JJM

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.38	68	29 - 138	

* Values outside of QC limits

VALUE CHANGE

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-06 File ID: data010-0

Sampled: 09/19/07 11:35 Prepared: 09/24/07 07:21 Analyzed: 10/10/07 01:11

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	~~0.25~~ 0.38 BA	5.0	0.10	J JG
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	0.46	5.0	0.24	J
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	0.53	5.0	0.22	J
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	10	5.0	0.20	

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.37	67	29 - 138	

* Values outside of QC limits

VALUE CHANGE

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW7

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-07 File ID: data011-0

Sampled: 09/19/07 12:32 Prepared: 09/24/07 07:21 Analyzed: 10/10/07 01:58

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	~~1.6~~ 2.5 RA 10/18/07	5.0	0.20	J JJ

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.00	62	29 - 138	

* Values outside of QC limits

VALUE CHANGE

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-08 File ID: data012-0

Sampled: 09/19/07 12:00 Prepared: 09/24/07 07:21 Analyzed: 10/10/07 02:45

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	2.4	5.0	0.20	J

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.95	61	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW4

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-09 File ID: data014-0

Sampled: 09/19/07 13:43 Prepared: 09/24/07 07:21 Analyzed: 10/10/07 04:20

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.11	63	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-10 File ID: data015-0

Sampled: 09/19/07 14:43 Prepared: 09/24/07 07:21 Analyzed: 10/10/07 05:07

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	3.99	61	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

54MW6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Ground Water Laboratory ID: 0709448-11 File ID: data016-0

Sampled: 09/19/07 16:35 Prepared: 09/24/07 07:21 Analyzed: 10/10/07 05:54

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.14	64	29 - 138	

* Values outside of QC limits

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ORGANIC ANALYSIS DATA SHEET
USEPA-8330

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-41 4MD

Client: URS Corporation Project: RFAAP SWMU 54 Quarterly Monitoring, 2007

Matrix: Water Laboratory ID: 0709448-12 File ID: data017-0

Sampled: 09/19/07 16:48 Prepared: 09/24/07 07:21 Analyzed: 10/10/07 06:41

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0711051 Sequence: 7100923 Calibration: 7H27005 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1	5.0	5.0	0.092	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	1	5.0	5.0	0.15	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	1	5.0	5.0	0.20	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	6.49	4.19	64	29 - 138	

* Values outside of QC limits

DATA VALIDATION WORKSHEET

Explosives

Reviewer: RA
Date: 10/18/07
DV Level: II III IV

Review Document:

_X__ Region III Modified for National Functional Guidelines
_X__ SW-846
_X__ Project QAPP/SAP

Project Name: Radford SWMU 54
Project Number: 116570 73 . 20000
Laboratory: TriMatrix
SDG No.: 36440-41
Test Name: Explosives
Method No.: 8330

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do sample preservation, collection and storage condition meet method requirement?	✓		
	If samples were received with the cooler temperature exceeding 20 ^{O}C, then flag L(+)/UL(-).			
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-). Extraction: (aqueous) 7 days and (soil) 14 days; and Analysis: 40 days.		✓	
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	✓		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		✓	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are at least five standards included in the calibration curve? If no, flag "R".	✓		
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".	✓		
4.3	Were continuing calibration standards analyzed every 12 hours or twenty samples? If no, flag "R".	✓		
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±15%) or %D(≤15%) within the	✓		
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>15%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 15%, J(+), only. Negative Bias - %D>-15% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes:

5.0 Laboratory Control Sample (LCS)		Yes	No	NA
5.1	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.2	Are there any %R for LCS/LCSD recoveries outside the QC limits?		✓	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
5.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.			✓

Notes:

6.0 Surrogate Recovery				Yes	No	NA
6.1	Are surrogate recoveries within acceptance criteria for all samples and method blanks?			✓		
6.2	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?					✓
6.3	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)					✓
		<10%	low	high		
	Positives	L	L	K		
	Non-detects	R	UL	No action		

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
7.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	✓		
7.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		✓	
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional judgement.			

Notes:

MS/MSD for 54MW2 < 80% for HMX 30%/19%.

Parent positive → J/M

8.0 Field Duplicate		Yes	No	NA
8.1	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	✓		

Notes: 54MW-7 & DUP-1 RL

HMX 2.5 J 2.4 J 5 OK ✓

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.	✓		
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	✓		

Notes: 2-Nitrotoluene in 54MW2 81.6% HMX in 54MW7 45.2% J/J

2,4,6-TNT in 54MW5 41.8% higher results should be used.

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit $95\%_{aq}$ and $90\%_{so}$)	✓		
10.1.1	Number of samples:			
10.1.2	Number of target compounds in each analysis: 14			
10.1.3	Number of results rejected or not reported:			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

54MW2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

SDG: 36440-41
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL

Laboratory ID: 0711051-MS1
QC Batch: 0711051

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	0.646	2.62	76	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	ND	1.98	76	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	0.779	2.67	73	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	ND	2.09	80	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	ND	2.02	78	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	1.04	4.89	74	50 - 155	ug/L
2-Nitrotoluene	2.60	0.344	2.20	71	45 - 135	ug/L
3-Nitrotoluene	2.60	ND	2.13	82	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	0.695	2.51	70	55 - 155	ug/L
4-Nitrotoluene	2.60	ND	2.01	77	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.60	ND	1.96	75	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	ND	2.26	87	20 - 175	ug/L
Nitrobenzene	2.60	ND	2.00	77	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5	2.60	8.15	8.94	30 *	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

54MW2

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-41
Client: URS Corporation
Project: RFAAP SWMU 54 Quarterly Monitoring, 2007
Matrix: Water
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL
Laboratory ID: 0711051-MSD1
QC Batch: 0711051

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	2.62	76	0.1	30	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	2.00	77	1	30	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	2.69	74	0.9	30	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	2.20	85	5	30	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	2.25	87	11	30	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	5.16	79	5	30	50 - 155	ug/L
2-Nitrotoluene	2.60	2.24	73	2	30	45 - 135	ug/L
3-Nitrotoluene	2.60	2.16	83	1	30	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	2.61	74	4	30	55 - 155	ug/L
4-Nitrotoluene	2.60	2.30	89	14	30	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.60	2.05	79	5	30	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	2.26	87	0.07	30	20 - 175	ug/L
Nitrobenzene	2.60	2.00	77	0.03	30	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5	2.60	8.66	19 *	3	30	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 54MW2 LAB SAMPLE # 0709448-05

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	AcclaimE1	AcclaimE2
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	5.77	5.49	6.09	8.15470	19.6%
	2	7.96	7.21	8.27	9.92380	
4-Amino-2,6-dinitrotolu	1	26.04	25.14	27.70	0.69490	33.4%
	2	34.85	31.05	36.35	0.97400	
1,3,5-Trinitrobenzene	1	13.60	13.00	14.36	0.64560	22.5%
	2	13.03	11.72	13.70	0.80910	
2,4,6-Trinitrotoluene	1	23.64	22.74	25.06	0.77860	28.7%
	2	21.90	19.57	22.87	1.03920	
2-Amino-4,6-dinitrotolu	1	27.64	26.59	29.51	1.04390	23.5%
	2	37.05	33.08	38.76	1.32190	
2-Nitrotoluene	1	33.78	32.20	35.84	0.34410	81.6%
	2	28.58	25.64	30.04	0.81800	

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 54MW5 LAB SAMPLE # 0709448-06

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	AcclaimE1	AcclaimE2
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	5.75	5.49	6.09	10.26220	24.0%
	2	7.98	7.21	8.27	13.06280	
4-Amino-2,6-dinitrotolu	1	25.95	25.14	27.70	0.53400	22.6%
	2	34.73	31.05	36.35	0.67000	
2,4,6-Trinitrotoluene	1	23.61	22.74	25.06	0.24880	41.8%
	2	21.81	19.57	22.87	0.38010	
2-Amino-4,6-dinitrotolu	1	27.56	26.59	29.51	0.46210	31.6%
	2	37.05	33.08	38.76	0.63580	

00133

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 54MW7 LAB SAMPLE # 0709448-07

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	AcclaimE1	AcclaimE2
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (ug/L)	RPD
HMX	1	5.84	5.49	6.09	1.57130	45.2%
	2	7.94	7.21	8.27	2.48910	

Project-specific Analytes of Concern

No project-specific analytes of concern were identified in the SOW, however, it is assumed that Method 8330 target analytes are of concern.

Quality Control Limits

Quality control limits specified in the DoD QSM were employed.

Hold Times

All samples were extracted/digested (where applicable) and analyzed within hold time.

Technical Issues

There were no general technical issues. Any issues unique to a particular parameter will be discussed in the QC section for it.

Sample Result Reporting Convention

Sample results are reported as RL 'U' (e.g., 0.001 U) if the target analyte was not detected above the MDL. If a sample for an organic parameter is reanalyzed and also reported, the second analysis includes the suffix 'REn' where n = the first, second, etc. reanalysis. If a sample is reanalyzed for confirmation purposes, is confirmed, and also reported, the second analysis includes the suffix 'RE1'. If the confirmation was not performed simultaneously, the second set of sample results is reported on a second Form 1 since that confirmation analysis did not occur at the same time and/or date.

Data Qualifier Designation

If applicable, a sample result is qualified with:

- a "U" flag if the analyte was not detected at a concentration greater than the MDL,
- a "B", "J", and/or an "E" flag as defined in the preceding Variance section,
- a LIMS-generated statement of qualification. Qualifying statements, if any, will be found in Attachment 2 to this narrative.

QC Batch and Analytical Batch Designation

A QC Batch is a seven digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation); it is limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.).

An Analytical Batch (or Sequence) is a seven digit number that associates all samples analyzed as a set under one analytical sequence.

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Individual sample results relate only to the sample tested.

Quality Control Results – Nitroaromatic Explosives

Note: data for second column confirmation analysis follows that provided for primary column analysis.

Calibration

All initial instrument calibrations, second source verification, and continuing calibration verifications for both the primary and confirmation columns were DoD QSM and method-compliant.

Method Blank

No target analytes were detected.

Surrogates

All surrogate recoveries were in control for both the primary column and confirmation column runs.

Laboratory Control Sample

The Laboratory Control Sample (LCS) was fortified with all target analytes. All recoveries were in control for both the primary column and confirmation columns.

Matrix Spikes

Sample 54MW2 was fortified with all target analytes. All recoveries except those for HMX on both the primary and confirmation columns were in control; see the matrix spike summary forms and text qualifiers for details. All RPDs were in control.

Sample Results

See Section B. Second-column analysis was needed for multiple samples due to tentative detections of one or more target analytes on the primary column. Of those samples where one or more analytes were confirmed, those confirmation analyses are identified by the laboratory sample ID plus an 'RE1' suffix. The confirmation analyses were performed at a different date and/or time and, for the samples for which a tentative detection was confirmed, summary forms and raw data have been included following that for the primary column. Where an analyte was confirmed, both sets of sample results have been reported.

Corrective Actions

No corrective actions were deemed necessary.

Statements of Data Qualification

See Narrative Attachment 2.

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Data Review and Approval

All data was reviewed and approved by the group supervisor/manager prior to further review by the project chemist.

Data Deliverables

The data deliverables, both hardcopy and electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD has been issued separate from this hardcopy report.

Walt Roudebush, Project Chemist

10/16/07
Date

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Individual sample results relate only to the sample tested.

STATEMENT OF DATA QUALIFICATIONS

Nitroaromatics & Nitramines by EPA Method 8330

Qualification:	The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.	
Analysis:	USEPA-8330	
Sample/Analyte:	0709448-05 54MW2	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
	0709448-05RE1 54MW2	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
Qualification:	The RPD between the detected values from the primary and confirmation analyses exceeded 40%. The lower concentration result has been reported.	
Analysis:	USEPA-8330	
Sample/Analyte:	0709448-05 54MW2	2-Nitrotoluene
	0709448-06 54MW5	2,4,6-Trinitrotoluene
	0709448-07 54MW7	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

Sample Receipt and Log-in

On September 21, 2007 at 08:30 hrs, three sample coolers containing multiple water samples were received at TriMatrix via FedEx (the carrier). The coolers had been shipped from the Site on September 20.

The external custody seal affixed to each cooler was intact. The samples were received on ice and in good condition. The receipt temperature of the interior of each cooler was measured via a 'temperature blank' shipped in it; the measured temperatures, in °C, were 1.2, 3.6, and 2.1.

Shipping documents included three field chains-of-custody (COC) and associated carrier air bills.

Sample 54MW2 was designated by the Client for MS/MSD analysis.

Given the absence of a sample collection time for the field duplicate (DUP-1) and the collection time of midnight that would then be assigned by TriMatrix's LIMS, TriMatrix assigned a collection time of 12:00 hours.

Samples were assigned to Work Order 0709448 and SDG 36440-41.

Copies of all referenced receipt and custody documents are provided in Section A of this data package. Correspondence regarding completed sample log-in activities will be found in Attachment 1 of this narrative.

Provision of Sample Receipt Information to Client

A copy of the COCs and receipt checklist were transmitted to the Client within one day of sample receipt. The Client did not request any modification(s) to the analyses, as listed on the COC.

Post-Receipt Sample Custody

Custody of the sample during sample preparation (if applicable) and analysis was assigned to individual analysts. Copies of completed 'internal chain of custody' forms are included in Section A.

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Variances

Data Qualifier Flags

Data qualifier flags other than those listed in the DoD QSM were employed or the definition of an existing flag was modified.

J – Estimated: the analyte was detected at a concentration greater than the limit of detection (i.e., MDL) but less than the reporting limit (i.e., MRL).

B – Blank contamination: The analyte was detected above one-half the reporting limit in an associated method blank. The same analyte in the sample was detected at less than five times the method blank concentration. (If a common laboratory contaminant is present in the method blank at a concentration greater than one-half the reporting limit but less than or equal to that reporting limit, any associated sample results are flagged but corrective action is not necessarily taken. A text qualifier is also associated with such a result.)

E – Exceeds calibration range: The analyte response exceeded the calibrated range of the instrument. (With the exception of metals for which only the final non-qualified result is reported, both the initial E-qualified result and final non-qualified result from reanalysis-at-dilution are reported.)

Text Qualifier

A LIMS-generated text qualifier is substituted for many instances in which the DoD QSM "Q" flag would otherwise apply. The text qualifiers are listed in a summary format by parameter with applicable samples identified.

Analytical Methods

Sample preparation and analytical methods that were employed are per the SOW.

Method Detection Limits, Target Analytes, and Reporting Limits

All method detection limits (MDL) for analytes in this report are compliant with the DoD QSM specification that each reporting limit (RL) employed is to be at least three times the MDL. In addition, no RL is less than the equivalent concentration of the lowest instrument calibration standard. The target analyte list was specified by the Client. Proposed RLs were submitted by TriMatrix to the Client prior to the receipt of any samples.

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 120862

Page 1 of 1

For Lab Use Only
Cart: 6
VOA Rack/Tray: —
Receipt Log No.: 1377
Project Chemist: LWSR2
Laboratory Project No.: E 07094448

Client Name: URS Corporation
Address: 5540 Falmouth Street, Ste 201
Richmond, VA 23233
Phone (804) 965-9000
Fax (804) 965-9764

Project Name: RFAAP-SWMU54-Qtr 4
Client Project No./P.O. No.: 11656351.30013
Invoice No.: ☒ Client ☐ Other (comments)
Contact/Report To: Roshanak Aryan

Analyses Requested

Explosives (A)

Container Type (corresponds to Container Packing List): 2

Number of Containers Submitted

PRESERVATIVES
A NONE pH~6
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
1	01	WG	01	54MW9 ✓	TM 0139	9/18/07	14:05		X	GW	2	2	
2	01	WG	02	54MW8 ✓		9/18/07	15:30		X	GW	2	2	
3	01	WG	03	54MW10 ✓		9/18/07	16:40		X	GW	2	2	
4	01	WG	04	54MW3 ✓		9/19/07	9:18		X	GW	2	2	
5													
6													
7													
8													
9													
10													

Sampled By (print): Tina DeVine
Sampler's Signature:
Company: URS Corp.

How Shipped? Hand Carrier FedEx
Tracking No.: 861754176960

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	9/20/07	12:32 PM						
	9/19/07	19:30						

1. Received By	Date	Time	2. Received By	Date	Time	Received For Lab By	Date	Time
						William Cole	9/21/07	0830

TriMatrixCOC -- COC WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

(A)

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 120865

Page 1 of 1

For Lab Use Only
Cart: C
VOA Rack/Tray: —
Receipt Log No.: 137
Project Chemist: LMR
Laboratory Project No.: E 07091-148

Client Name	Project Name
URS Corporation	RFAAP - SWMU 54 - QTR 4
Address: 5540 Falmouth St, Ste 201	Client Project No./P.O. No.: 11652635
Richmond VA 23230	Invoice No. ☑ Client ☐ Other (comments)
Phone (804) 965-9000	Contact/Report To: Roshanak Aryan
Fax (804) 965-9764	

Analyses Requested

Explosives

Container Type (corresponds to Container Packing List): A

Number of Containers Submitted: 2

⇦ PRESERVATIVES
A NONE pH~5
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
1	03	WG	03	54MW2 ✓	—	9/19/07	10:37		X	GW	2	2	
2				54MW2 MS		9/19/07	10:37		X		2	2	
3				54MW2 MSD			10:37		X		2	2	
4	01	WG	06	54MW5 ✓			11:35		X		2	2	
5	01	WG	07	54MW7 ✓			12:32		X		2	2	
6													
7													
8													
9													
10													

Sampled By (print): Tina DeVine
Sampler's Signature: [signature]

How Shipped? Hand Carrier FedEx
Tracking No.: 861754176960

Comments

Company: URS Corp

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	9/20/07	12:30						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						William Cole	9/21/07	0830

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 120863

Page 1 of 1

For Lab Use Only

Cart: CO
VOA Rack/Tray: —
Receipt Log No.: 137
Project Chemist: LMSR
Laboratory Project No.: E 07094448

Client Name	Project Name
URS Corporation	RFAAP-SWMU54-Qtr-4
Address: 5540 Falmouth St, Suite 201	Client Project No./P.O. No.: 11656351.30013
Richmond, VA 23230	Invoice No. ☒ Client ☐ Other (comments)
Phone (804) 965-9000	Contact/Report To: Roshanak Aryan
Fax (804) 965-9764	

Analyses Requested

Explosives (A)

Container Type (corresponds to Container Packing List): 2

Number of Containers Submitted

PRESERVATIVES
A NONE pH~5
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Test Group	Matrix Codes	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	A	Total	Sample Comments
1	02	WG	08	DUP-1 ✓	—	9/19/07	—		X	GW	2	2	
2	01	WG	09	54MW4 ✓	↓	↓	1343		X	↓	2	2	
3	01	WG	10	54MW1 ✓			1443		X		2	2	
4	01	WG	11	54MW6 ✓			1635		X		2	2	
5	04	WQ	12	~~54MW~~ EQBK-1 ✓	↓	↓	1648		X	↓ Water	2	2	
6													
7													
8													
9													
10													

Sampled By (print): Tina DeVine
Sampler's Signature: [signature]
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.: 8617 5417 0960

	Relinquished By	Date	Time	Received By	Date	Time
1	[signature]	9/20/07	12:30	[signature]	9/19/07	1930
2						
3						

Comments: 2 empty ambers returned as requested
* Δ'd Dup-1 collection time to 12:00 hrs since lack of a time = midnight. TM mark (ATO)

3. Received For Lab By: [signature] Date 9/21/07 Time 0830

TriMatrixCOC -- COC WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination	n	Failed Signal to noise ratio		

DATA VALIDATION REPORT - Level III Review

SDG No.: SWM054-GWQ2 **Fraction:** Perchlorate

Lab: Columbia Analytical Services **Project Name** Radford SWMU 54

Reviewer: RA **Date:** April 23, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The percent recoveries were diluted out for the matrix spike pair analyzed for sample 54MW-2. No data qualifying action was required since the original sample result was greater than 4 times the spike amount.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable for their intended purpose based on the data reviewed.

Signed: R Argam

CAS ASP/CLP BATCHING FORM / LOGIN SHEET

SDG #:54MW
SUBMISSION R2736845
CLIENT: URS Corp.
CLIENT REP: Michael Perry
PROJECT: SWM054-GWQ2

BATCH COMPLETE: __yes_____
DISKETTE REQUESTED: Y_X__ N____
DATE: 3/30/07
CUSTODY SEAL: PRESENT
CHAIN OF CUSTODY: PRESENT

DATE REVISED:
DATE DUE: 4/18/07
PROTOCOL: SW846
SHIPPING No.:

CAS JOB #	CLIENT/EPA ID	MATRIX	REQUESTED PARAMETERS	DATE SAMPLED	DATE RECEIVED	pH (SOLIDS)	% SOLIDS	REMARKS AMPLE CONDITIO
989467	54MW-9	WATER	Perchlorate by 6850	3/27/2007	3/29/2007			
989472	54MW-4	WATER	Perchlorate by 6850	3/27/2007	3/29/2007			
989473	54MW-6	WATER	Perchlorate by 6850	3/27/2007	3/29/2007			
989474	54MW-8	WATER	Perchlorate by 6850	3/27/2007	3/29/2007			
989475	DUP-1 Dups	WATER	Perchlorate by 6850	3/27/2007	3/29/2007			
989476	54MW-10	WATER	Perchlorate by 6850	3/27/2007	3/29/2007			
989477	54MW-7	WATER	Perchlorate by 6850	3/27/2007	3/29/2007			
989478	54MW-1	WATER	Perchlorate by 6850	3/28/2007	3/29/2007			
989479	54MW-5	WATER	Perchlorate by 6850	3/28/2007	3/29/2007			
989480	54MW-2 # QC	WATER	Perchlorate by 6850	3/28/2007	3/29/2007			
989481	54MW-3	WATER	Perchlorate by 6850	3/28/2007	3/29/2007			
989482	EB-1	WATER	Perchlorate by 6850	3/28/2007	3/29/2007			

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : 54MW-9

Date Sampled : 03/27/07 14:10 **Order #:** 989467 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 04/04/07				
DATE ANALYZED : 04/04/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.036	0.20	0.24	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : 54MW-4

Date Sampled : 03/27/07 15:55 **Order #:** 989472 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 04/04/07				
DATE ANALYZED	: 04/04/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.036	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : 54MW-6

Date Sampled : 03/27/07 10:25 **Order #:** 989473 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 04/04/07				
DATE ANALYZED	: 04/04/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.036	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : 54MW-8

Date Sampled : 03/27/07 13:30 **Order #:** 989474 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 04/04/07				
DATE ANALYZED	: 04/04/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.036	0.20	0.26	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : DUP-1

Date Sampled : 03/27/07 13:30 **Order #:** 989475 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 04/04/07				
DATE ANALYZED	: 04/04/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.036	0.20	2.9	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : 54MW-10

Date Sampled : 03/27/07 12:11 **Order #:** 989476 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 04/04/07				
DATE ANALYZED	: 04/04/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.036	0.20	2.9	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : 54MW-7

Date Sampled : 03/27/07 16:28 **Order #:** 989477 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 04/04/07				
DATE ANALYZED	: 04/04/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.036	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : 54MW-1

Date Sampled : 03/28/07 09:55 **Order #:** 989478 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 04/04/07				
DATE ANALYZED	: 04/04/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.036	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : 54MW-5

Date Sampled : 03/28/07 10:30 **Order #:** 989479 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 04/04/07				
DATE ANALYZED	: 04/04/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.036	0.20	0.52	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : 54MW-2

Date Sampled : 03/28/07 11:30 **Order #:** 989480 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 04/04/07				
DATE ANALYZED	: 04/04/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.036	0.20	3.6	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : 54MW-3

Date Sampled : 03/28/07 12:21 **Order #:** 989481 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 04/04/07				
DATE ANALYZED	: 04/04/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.036	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 04/18/07

URS Corp.
Project Reference: SWM054-GWQ2
Client Sample ID : EB-1

Date Sampled : 03/28/07 12:45 **Order #:** 989482 **Sample Matrix:** WATER
Date Received: 03/29/07 **Submission #:** R2736845 **Analytical Run** 143240

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 04/04/07				
DATE ANALYZED : 04/04/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.036	0.20	0.20 U	UG/L

DATA VALIDATION WORKSHEET

Perchlorate

Reviewer: RA
Date: 4/23/07
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: SWMU 54
Project Number: 116363351.30007
Laboratory: Columbia Analytical
SDG No.: ~~R27368445~~ SWMO54-GW02
Test Name: Perchlorate
Method No.: 6850

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample collection, preservation, shipping, and storage condition meet the project controlling documents?	✓		
	Action: No chemical preservation required.			✓
2.2	Have any technical holding times (28 days), determined from date of sampling to date of analysis, (including dilution or reanalysis) been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks prepared at the appropriate frequency? If not, note in DV report.	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the [sample]≤ 5X[associated blank].		✓	
3.3	Do any field equipment blanks blanks have positive results? If Yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve?If no apply R flags.	✓		
4.2	Are all initial calibration correlation coefficient within the control limits (r>0.99)?If no J(+), R (-)	✓		
4.3	Was an ICV analyzed and are %RSDs < 15%? If no J(+), UJ(-)	✓		
4.4	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Are %Ds < 25%. If no, R (-), J (+).	✓		

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?(75-125% for water and soil)	✓		
5.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (i.e., 15%)?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data.			

Notes:

MS/MSD Not calculated → outside QC limits. No action, original sample result 54MW-2 was > 4x spike amt.

6.0 Laboratory Control Sample(LCS)		Yes	No	NA
6.1	Is the LCS recovery form present?	✓		
6.2	Was LCS analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Is the %R for LCS outside the QC limits(85-115% for water and soil)? If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits(i.e., 15%)? If Yes, J(+) only.			✓

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
	For sample results > 5 x RL, use 50% RPD. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 x RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV	✓		

Notes:

DUP-1 and 54MW-10

Perchlorate 2.9 2.9 OKV %RPD = 0%.

8.0 Laboratory Duplicates		Yes	No	NA
8.1	Was a lab duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
8.2	Are all analyte duplicate results within control limits (i.e., RPD < 15%)? If no, J(+) only.	✓		

Notes:

9.0 Internal Standards		Yes	No	NA
9.1	Are internal standard areas of every sample and blank within +/-30% of the ICV or CCV? If no, J(+), UJ(-)	✓		
	If the IS area count criteria is not met, corrective action should be taken to resolve the problem and the entire batch should			
	be re-analyzed.			✓

10.0 Detection Limit Verification		Yes	No	NA
10.1	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
10.2	Were sample concentrations above the highest standard run at a dilution? If not, note in DV report.	✓		

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit 90%)	✓		
11.2	Number of samples:			
11.3	Number of target compounds in each analysis:			
11.4	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = 100%			

Notes:

CASE NARRATIVE
COMPANY: URS
PROJECT: SWM054-GWQ2
SUBMISSION #: R2736845

Samples were collected on 03/27/07 – 03/28/07 and received at CAS/Rochester on 03/29/07 in good condition at a cooler temperature of 1 °C. A Level 4 Data package has been delivered.

PERCHLORATE ANALYSIS

Twelve water samples were analyzed for Perchlorate by LC/MS method 6850 with DOD modifications from the DOD Perchlorate Handbook. Values detected between the MDL and PQL have been flagged with a "J" as estimated.

All the initial and continuing calibration criteria were met for all analytes.

Site-specific QC was done on sample 54MW-2. The recoveries were diluted out due to the level of Perchlorate detected in the sample. The RPD was within QC limits. The Blank Spike (LCS) and LODV spike recoveries were within QC limits.

The Laboratory Blank associated with these samples was free of contamination.

No other analytical or QC problems were encountered.

COLUMBIA ANALYTICAL SERVICES

QUALITY CONTROL SUMMARY MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

WATER

Spiked Order No. : 989480 URS Corp.

Client ID: 54MW-2

Test: 6850

Analytical Units: UG/L

Run Number : 143240

ANALYTE	SPIKE ADDED	CONCENT. SAMPLE	MATRIX SPIKE FOUND	MATRIX SPIKE % REC.	MATRIX SPIKE DUP. FOUND	MATRIX SPIKE DUP. % REC.	RPD	QC LIMITS RPD	QC LIMITS REC.
PERCHLORATE	0.200	3.60	3.90	D	3.90	D	0	20	80 - 120

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OLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD: 6850

LABORATORY CONTROL SAMPLE SUMMARY

REFERENCE ORDER #: 994248 ANALYTICAL RUN # : 143240

ANALYTE	TRUE VALUE	% RECOVERY	QC LIMITS
DATE ANALYZED : 04/04/07 ANALYTICAL DILUTION: 1.0			
PERCHLORATE	0.200	95	80 - 120

OKV

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Columbia Analytical Services																
Method Detection Limit Study																
Analytical Method:	Perchlorate by DOD Handbook															
Extr./Dig. Method:	as per															
Matrix:	Water															
Units:	ug/L															
Analyst(s):	Ttraver															
Instrument:	Agilenet HPLCMS															
Sample ID:		MDL-1	MDL-2	MDL-3	MDL-4	MDL-5	MDL-6	MDL-7								
Date Analyzed:		1/26/2007	1/26/2007	1/26/2007	1/26/2007	1/26/2007	1/26/2007	1/26/2007								
Analyte:	Spike Level:	Result 1	Result 2	Result 3	Result 4	Result 5	Result 6	Result 7	Mean	Std Dev.	T-Value	Calc. MDL	Reported MRL	% RSD	Average % Rec.	MDL Qualifier notes
Perchlorate	0.20	0.210	0.200	0.190	0.210	0.210	0.190	0.220	0.204	0.011	3.143	0.036	0.2	6%	102%	Valid MDL Data

MDL study

H:\GROUP\EXCEL\6850\Perc000.xls

1/29/07

Supervisor Approval _____

QA/QC Approval _____

Columbia Analytical Services INC.
An Employee - Owned Company

ACCREDITED IN ACCORDANCE WITH nelac

Service Quality Ethics Environment
ACIL
2005 Seal of Excellence Program

ORGANIC QUALIFIERS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds, or when the data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit and greater than the MDL. This flag is also used for DoD instead of "P" as indicated below.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search.

P - This flag is used for a pesticide/Aroclor target analyte when there is a greater than 40% (25% for CLP) difference for detected concentrations between the two GC columns. The concentration is reported on the Form I and flagged with a "P" ("J" for DoD).

Q - for DoD only – indicates a pesticide/Aroclor target is not confirmed. This flag is used when there is ≥ 100% difference for the detected concentrations between the two GC columns.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and ALL concentration values reported on that Form I are flagged with the "D" flag.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - As specified in Case Narrative.

* - This flag identifies compounds associated with a quality control parameter which exceeds laboratory limits.

CAS/Rochester Lab ID # for State Certifications

NELAP Accredited
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Illinois ID #200047
Maine ID #NY0032
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited
New Jersey ID # NY004
New York ID # 10145
New Hampshire ID # 294100 A/B
Pennsylvania ID# 68-786
Rhode Island ID # 158
West Virginia ID # 292

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CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

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PAGE 1 OF 2

SR #

CAS Contact

Project Name: SWMU54-GWQ2	Project Number: 1116563S1
Project Manager: Roshanak Aryan	Report CC: Roshanak Aryan
Company/Address: URS Corporation 5540 Falmouth Street, Suite 201 Richmond, VA 23230	
Phone #: (804) 965-9000	FAX#: (804) 965-9764
Sampler's Signature	Sampler's Printed Name

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE: 0

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624 ☐ CLP	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ CLP	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES ☐ 8081 ☐ 608 ☐ CLP	PCB's ☐ 8082 ☐ 608 ☐ CLP	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	Perchlorate (6850)	REMARKS/ ALTERNATE DESCRIPTION
54MW-9		3/28/07	1410	GW	1								✓	
54MW-4			1555		1								✓	
54MW-6			1025		1								✓	
54MW-8			1370		1								✓	
Dup-1			—		1								✓	
54MW-10			1211		1								✓	
54MW-7			1628		1								✓	
54MW-1		3/28/07	955		1								✓	
54MW-5			1070		1								✓	
54MW-2			1170		1								✓	

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 24 hr ____ 48 hr ____ 5 day
✓ STANDARD
REQUESTED FAX DATE
REQUESTED REPORT DATE

REPORT REQUIREMENTS
____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
X IV. Data Validation Report with Raw Data
____ V. Specialized Forms / Custom Report
Edata ____ Yes ____ No

INVOICE INFORMATION
PO#
BILL TO:
R2736845
SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: 10°C CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature:	Signature:	Signature	Signature	Signature	Signature
Printed Name: John Spagna	Printed Name: Gregory D. Emerian	Printed Name	Printed Name	Printed Name	Printed Name
Firm: URS	Firm: CAS	Firm	Firm	Firm	Firm
Date/Time: 3/28/07 15:00	Date/Time: 3-29-07 10:00	Date/Time	Date/Time	Date/Time	Date/Time

SCOC-1102-08

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

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SDG #

CAS Contact

Project Name: SWMU54-GWQ2	Project Number: 11656351
Project Manager: Roshanak Aryan	Report CC: Roshanak Aryan
Company/Address: URS Corporation 5540 Falmouth Street, Suite 201 Richmond VA 23230	
Phone #: (804) 965-9000	FAX#: (804) 965-9764
Sampler's Signature	Sampler's Printed Name

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE

Preservative Key: 0. NONE; 1. HCL; 2. HNO_3; 3. H_2SO_4; 4. NaOH; 5. Zn. Acetate; 6. MeOH; 7. $NaHSO_4$; 8. Other

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624 ☐ CLP	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ CLP	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES ☐ 8081 ☐ 608 ☐ CLP	PCB's ☐ 8082 ☐ 608 ☐ CLP	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	Perchlorate (6850)	REMARKS/ ALTERNATE DESCRIPTION
54MW-2MS/MSD		3/28/07	1130	GW	2								✓	
54MW-3			1221		1								✓	
EB-1			1245		1								✓	

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 24 hr ____ 48 hr ____ 5 day
____ STANDARD
REQUESTED FAX DATE
REQUESTED REPORT DATE

REPORT REQUIREMENTS
____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
____ V. Speicalized Forms / Custom Report
Edata ____ Yes ____ No

INVOICE INFORMATION
PO#
BILL TO:
R2736845
SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: 10C CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Joshua Spangler	Printed Name	Printed Name	Printed Name	Printed Name	Printed Name
Firm: URS	Firm	Firm	Firm	Firm	Firm
Date/Time: 3/28/07 1500	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

SCOC-1102-08

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

Cooler Receipt And Preservation Check Form

Project/Client URS Submission Number RQ-36845

Cooler received on 3-29-07 by: KE COURIER: CAS UPS (FEDEX) VELOCITY CLIENT

1.	Were custody seals on outside of cooler?	(YES)	NO			
2.	Were custody papers properly filled out (ink, signed, etc.)?	(YES)	NO			
3.	Did all bottles arrive in good condition (unbroken)? see below	(YES)	NO			
4.	Did any VOA vials have significant air bubbles?	YES	NO	(N/A)		
5.	Were Ice or Ice packs present?	(YES)	NO			
6.	Where did the bottles originate?	(CAS/ROC)	CLIENT			
7.	Temperature of cooler(s) upon receipt:	1°				
	Is the temperature within 0° - 6° C?:	(Yes)	Yes	Yes	Yes	Yes
	If No, Explain Below	No	No	No	No	No

Date/Time Temperatures Taken: 3-29-07 10:32

Thermometer ID: 161 or (IR GUN) Reading From: Temp Blank or (Sample Bottle)

If out of Temperature, Client Approval to Run Samples _____

PC Secondary Review: MLP 3/29/07

Cooler Breakdown: Date: 3-29-07 by: KE

1.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
2.	Did all bottle labels and tags agree with custody papers?	(YES)	NO
3.	Were correct containers used for the tests indicated?	(YES)	NO
4.	Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated		(N/A)

Explain any discrepancies: _____

		YES	NO	Sample I.D.	Reagent	Vol. Added	Final pH
pH	Reagent						
≥12	NaOH						
≤2	HNO_3						
≤2	H_2SO_4						
Residual Chlorine (+/-)	for TCN & Phenol						

YES = All samples OK NO = Samples were preserved at lab as listed PC OK to adjust pH_____

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2		

PC Secondary Review: _____

Other Comments:

1 Bottle from Loc. 54 MW-2 fell onto the floor, and the cap broke, losing most of the sample from the bottle. This is the QC Location and there are 2 other bottles that are O.K.
KE 3-29-07

DATA VALIDATION REPORT - Level III Review

SDG No.: R2738024 **Fraction:** Perchlorate

Lab: Columbia Analytical Services **Project Name** Radford SWMU 54

Reviewer: RA **Date:** June 26, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The percent recoveries were diluted out for the matrix spike pair analyzed for sample 54MW-2. No data qualifying action was required since the original sample result was greater than 4 times the spike amount.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable for their intended purpose based on the data reviewed.

Signed: Rayan

CAS ASP/CLP BATCHING FORM / LOGIN SHEET

SDG #:54MW
SUBMISSION R2738024
CLIENT: URS Corp.
CLIENT REP: Michael Perry
PROJECT: SWM054

BATCH COMPLETE: __yes_____
DISKETTE REQUESTED: Y_X__ N____
DATE: 6/11/07
CUSTODY SEAL: PRESENT
CHAIN OF CUSTODY: PRESENT

DATE REVISED:
DATE DUE: 6/28/07
PROTOCOL: SW846
SHIPPING No.:

CAS JOB #	CLIENT/EPA ID	MATRIX	REQUESTED PARAMETERS	DATE SAMPLED	DATE RECEIVED	pH (SOLIDS)	% SOLIDS	REMARKS SAMPLE CONDITION
1009312	54MW-6	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009313	54MW-4	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009314	54MW-7	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009315	54MW-8	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009318	54MW-9	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009330	54MW-10	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009333	54MW-2 + QC	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009335	54MW-3	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009338	54MW-1	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009339	54MW-5	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009343	DUP-1	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009344	EQ. BLANK-1	WATER	6850-Perchlorate	6/5/2007	6/7/2007			
1009348	TRIP BLANK	WATER	6850-Perchlorate	6/5/2007	6/7/2007			

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : 54MW-6

Date Sampled : 06/05/07 10:55 **Order #:** 1009312 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/12/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : 54MW-4

Date Sampled : 06/05/07 12:18 **Order #:** 1009313 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 06/12/07				
DATE ANALYZED	: 06/12/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : 54MW-7

Date Sampled : 06/05/07 12:37 **Order #:** 1009314 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/12/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : 54MW-8

Date Sampled : 06/05/07 14:13 **Order #:** 1009315 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 06/12/07				
DATE ANALYZED	: 06/12/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.080	0.20	0.70	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : 54MW-9

Date Sampled : 06/05/07 14:35 **Order #:** 1009318 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE		MDL	PQL	RESULT	UNITS
DATE EXTRACTED	: 06/12/07				
DATE ANALYZED	: 06/13/07				
ANALYTICAL DILUTION:	1.00				
PERCHLORATE		0.080	0.20	0.23	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : 54MW-10

Date Sampled : 06/05/07 15:50 **Order #:** 1009330 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/13/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.37	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : 54MW-2

Date Sampled : 06/05/07 17:10 **Order #:** 1009333 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/13/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	2.0	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : 54MW-3

Date Sampled : 06/05/07 17:30 **Order #:** 1009335 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/13/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.88	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : 54MW-1

Date Sampled : 06/05/07 19:29 **Order #:** 1009338 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/13/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : 54MW-5

Date Sampled : 06/05/07 18:40 **Order #:** 1009339 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/13/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.58	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : DUP-1

Date Sampled : 06/05/07 : **Order #:** 1009343 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/13/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : EQ. BLANK-1

Date Sampled : 06/05/07 11:20 **Order #:** 1009344 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/13/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

URS Corp.
Project Reference: SWM054
Client Sample ID : TRIP BLANK

Date Sampled : 06/05/07 11:20 **Order #:** 1009348 **Sample Matrix:** WATER
Date Received: 06/07/07 **Submission #:** R2738024 **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/13/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

DATA VALIDATION WORKSHEET

Perchlorate

Reviewer: RA
Date: 4/26/07
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: SWMU54
Project Number:
Laboratory: Columbia Analytical
SDG No.: R2738024
Test Name: Perchlorate
Method No.: 6850

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample collection, preservation, shipping, and storage condition meet the project controlling documents?	✓		
	Action: No chemical preservation required.			✓
2.2	Have any technical holding times (28 days), determined from date of sampling to date of analysis, (including dilution or reanalysis) been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks prepared at the appropriate frequency? If not, note in DV report.	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the [sample]≤ 5X[associated blank].		✓	
3.3	Do any field equipment blanks blanks have positive results? If Yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve?If no apply R flags.	✓		
4.2	Are all initial calibration correlation coefficient within the control limits (r>0.99)?If no J(+), R (-)	✓		
4.3	Was an ICV analyzed and are %RSDs < 15%? If no J(+), UJ(-)	✓		
4.4	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Are %Ds < 25%. If no, R (-), J (+).	✓		

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?(75-125% for water and soil)	✓		
5.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (i.e., 15%)?	✓	✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data.			

Notes:

MS/MSD for 54MW-2

%Rs diluted out. No action sample result 74X spike amt.

6.0 Laboratory Control Sample(LCS)		Yes	No	NA
6.1	Is the LCS recovery form present?	✓		
6.2	Was LCS analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Is the %R for LCS outside the QC limits(85-115% for water and soil)? If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits(i.e., 15%)? If Yes, J(+) only.		✓	

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
	For sample results > 5 x RL, use 50% RPD. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 x RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV	✓		

Notes:

54MW-4 and DUP-1

RD RD

8.0 Laboratory Duplicates		Yes	No	NA
8.1	Was a lab duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
8.2	Are all analyte duplicate results within control limits (i.e., RPD < 15%)? If no, J(+) only.	✓		

Notes:

9.0 Internal Standards		Yes	No	NA
9.1	Are internal standard areas of every sample and blank within +/-30% of the ICV or CCV? If no, J(+), UJ(-)	✓		
	If the IS area count criteria is not met, corrective action should be taken to resolve the problem and the entire batch should			
	be re-analyzed.	✓		

10.0 Detection Limit Verification		Yes	No	NA
10.1	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
10.2	Were sample concentrations above the highest standard run at a dilution? If not, note in DV report.			✓

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit 90%)	✓		
11.2	Number of samples:			
11.3	Number of target compounds in each analysis:			
11.4	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = 100%			

Notes:

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 06/19/07

Project Reference:
Client Sample ID : METHOD BLANK

Date Sampled : **Order #:** 1011440 **Sample Matrix:** WATER
Date Received: **Submission #:** **Analytical Run** 146001

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 06/12/07				
DATE ANALYZED : 06/12/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

QUALITY CONTROL SUMMARY MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

WATER

Spiked Order No. : 1009333 URS Corp.

Client ID: 54MW-2

Test: 6850

Analytical Units: UG/L

Run Number : 146001

	SPIKE		MATRIX SPIKE		MATRIX SPIKE DUP.			QC LIMITS	
ANALYTE	ADDED	CONCENT. SAMPLE	FOUND	% REC.	FOUND	% REC.	RPD	RPD	REC.
PERCHLORATE	0.200	2.00	2.20	D	2.30	D	4	20	80 - 120

OK 4X SPIKE ✓

22

LUMBIA ANALYTICAL SERVICES

ALITY CONTROL SUMMARY: LABORATORY CONTROL SAMPLE
WATER

Spiked Order No. : 1011443

Dup Spiked Order No. : 1011445

Client ID:

Test: 6850

Analytical Units: UG/L

Run Number : 146001

			BLANK SPIKE		BLANK SPIKE DUP.			QC LIMITS	
ANALYTE	SPIKE ADDED	SAMPLE CONCENT.	FOUND	% REC.	FOUND	% REC.	RPD	RPD	REC.
PERCHLORATE	0.20	0	0.180	90	0.190	95	5	20	80 - 120

Columbia Analytical Services

Method Detection Limit Study

Analytical Method:	PERCHLORATE DOD
Extr./Dig. Method:	SAME
Matrix:	WATER
Units:	ug/L(PPB)
Analyst(s):	ttraver
Instrument:	hplc02/hplcms

Sample ID:		MDL-1	MDL-2	MDL-3	MDL-4	MDL-5	MDL-6	MDL-7								
Date Analyzed:		4/24/2007	4/24/2007	4/24/2007	4/24/2007	4/24/2007	4/24/2007	4/24/2007								
Analyte:	Spike Level:	Result 1	Result 2	Result 3	Result 4	Result 5	Result 6	Result 7	Mean	Std Dev.	T-Value	Calc. MDL	Reported MRL	% RSD	Average % Rec.	MDL Qualifier notes
Perchlorate	0.20	0.170	0.200	0.240	0.190	0.220	0.170	0.200	0.199	0.025	3.143	0.080	0.2	13%	99%	Valid MDL Data

4/30

Supervisor Approval _____

QA/QC Approval _____

CASE NARRATIVE
COMPANY: URS
PROJECT: SWM054
SUBMISSION #: R2738024

Samples were collected on 06/05/07 and received at CAS/Rochester on 06/07/07 in good condition at a cooler temperature of 4 °C. A Level 4 Data package has been delivered.

PERCHLORATE ANALYSIS

Thirteen water samples were analyzed for Perchlorate by LC/MS method 6850 with DOD modifications from the DOD Perchlorate Handbook. Values detected between the MDL and PQL have been flagged with a "J" as estimated.

All the initial and continuing calibration criteria were met for all analytes.

Site-specific QC was done on sample 54MW-2. The recoveries were diluted out due to the level of Perchlorate detected in the sample and have been flagged with a "D". The RPD was within QC limits. The Blank Spike (LCS) and LODV spike recoveries were within QC limits.

The Laboratory Blank associated with these samples was free of contamination.

No other analytical or QC problems were encountered.

Columbia Analytical Services, Inc.

A FULL SERVICE ENVIRONMENTAL LABORATORY

June 19, 2007

Ms. Roshanak Aryan
URS Corp.
5540 Falmouth Street
Suite 201
Richmond, VA 23230

PROJECT:SWM054
Submission #:R2738024

Dear Ms. Aryan

Enclosed are the analytical results of the analyses requested. All data has been reviewed prior to report submission. Should you have any questions please contact me at (585) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Michael K. Perry

Michael Perry
Laboratory Director

Enc.

Columbia Analytical Services, Inc.
1 Mustard ST.
Suite 250
Rochester, NY 14609
(585) 288-5380

THIS IS AN ANALYTICAL TEST REPORT FOR:

Client : URS Corp.
Project Reference: SWM054
Lab Submission # : R2738024
Project Manager : Michael Perry
Reported : 06/19/07

Report Contains a total of 23 pages

The results reported herein relate only to the samples received by the laboratory. This report may not be reproduced except in full, without the approval of Columbia Analytical Services.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director to comply with NELAC standards prior to report submittal. Michael K. Perry

Columbia Analytical Services INC.
An Employee - Owned Company

ACCREDITED IN ACCORDANCE WITH nelac

2005 Seal of Excellence Program

ORGANIC QUALIFIERS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds, or when the data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit and greater than the MDL. This flag is also used for DoD instead of "P" as indicated below.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search.

P - This flag is used for a pesticide/Aroclor target analyte when there is a greater than 40% (25% for CLP) difference for detected concentrations between the two GC columns. The concentration is reported on the Form I and flagged with a "P" ("J" for DoD).

Q - for DoD only – indicates a pesticide/Aroclor target is not confirmed. This flag is used when there is ≥ 100% difference for the detected concentrations between the two GC columns.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and ALL concentration values reported on that Form I are flagged with the "D" flag.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - As specified in Case Narrative.

* - This flag identifies compounds associated with a quality control parameter which exceeds laboratory limits.

CAS/Rochester Lab ID # for State Certifications

NELAP Accredited
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Illinois ID #200047
Maine ID #NY0032
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited
New Jersey ID # NY004
New York ID # 10145
New Hampshire ID # 294100 A/B
Pennsylvania ID# 68-786
Rhode Island ID # 158
West Virginia ID # 292

Columbia Analytical Services, INC.
An Employee - Owned Company
www.caslab.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

One Mustard St., Suite 250 • Rochester, NY 14609-0859 • (585) 288-5380 • 800-695-7222 x11 • FAX (585) 288-8475

PAGE 1 OF 2

SR #

CAS Contact

Project Name: SWMU 54	Project Number: 11652351
Project Manager: Jim Spencer	Report CC: Roshena K. Aryan
Company/Address: 5540 Falmouth St, Suite 201, Richmond VA 23230	
Phone #: 804-965-9000	FAX#: 804-965-9764
Sampler's Signature:	Sampler's Printed Name: Tina DeVine

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

PRESERVATIVE: 0

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624 ☐ CLP	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ CLP	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES ☐ 8081 ☐ 608 ☐ CLP	PCB's ☐ 8082 ☐ 608 ☐ CLP	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	Perchlorate (6850)							REMARKS/ ALTERNATE DESCRIPTION
54MW-6	1009312	6/5/07	10:55	GW	1								X							
54MW-4	1009313		12:18		1								X							
54MW-7	1009314		12:37		1								X							
54MW-8	1009315		14:13		1								X							
54MW-9	1009318		14:35		1								X							
54MW-10	1009330		15:50		1								X							
54MW-2	1009333		17:10		1								X							
54MW-2MS			17:10		1								X							
54MW-2MSD			17:10		1								X							
54MW-3	1009335		17:30		1								X							

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 24 hr ____ 48 hr ____ 5 day
__X__ STANDARD
REQUESTED FAX DATE
REQUESTED REPORT DATE

REPORT REQUIREMENTS
____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
____ V. Speicalized Forms / Custom Report
Edata ____ Yes ____ No

INVOICE INFORMATION
PO#
BILL TO:
R2738024
SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: 4°C CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature	Signature	Signature	Signature	Signature
Tina DeVine					
Printed Name	Printed Name	Printed Name	Printed Name	Printed Name	Printed Name
URS Corp	Heather Lacy				
Firm	Firm	Firm	Firm	Firm	Firm
6/6/07 1:30	CTS				
Date/Time	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time
	6/7/07 925				

SCOC-1102-08

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

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PAGE 2 OF 2

SR #

CAS Contact

Project Name: SWMU 54	Project Number: 11656351
Project Manager: Lisa Spencer	Report CC: Roshanak Aryan
Company/Address: 3540 Falmouth Street, Suite 201, Richmond VA 23233	
Phone #: 804-965-9000	FAX#: 804-965-9764
Sampler's Signature:	Sampler's Printed Name: Tina DeVine

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE: 0

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624 ☐ CLP	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ CLP	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES ☐ 8081 ☐ 608 ☐ CLP	PCB's ☐ 8082 ☐ 608 ☐ CLP	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	Perchlorate (6850)	REMARKS/ ALTERNATE DESCRIPTION
54 MW-1	1009338	6/5/07	19:24	GW	1								X	
54 MW-5	1009339		18:40		1								X	
DUP-1	1009343		—		1								X	
Eq. Blank-1	1009344		11:20		1								X	
Trip Blank (Housed for Eq Blank)	1009348		11:20		1								X	

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
_____ RUSH (SURCHARGES APPLY)
____ 24 hr ____ 48 hr ____ 5 day
X STANDARD
REQUESTED FAX DATE
_____
REQUESTED REPORT DATE
_____

REPORT REQUIREMENTS
____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
____ V. Speicalized Forms / Custom Report
Edata ____ Yes ____ No

INVOICE INFORMATION
PO#
BILL TO:
SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: _____ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature:	Signature:	Signature:	Signature:	Signature:	Signature:
Printed Name: Tina DeVine	Printed Name: Heather Lovegrove	Printed Name:	Printed Name:	Printed Name:	Printed Name:
Firm: VRS	Firm: CTS	Firm:	Firm:	Firm:	Firm:
Date/Time: 6/6/07 1:30	Date/Time: 6/7/07 925	Date/Time:	Date/Time:	Date/Time:	Date/Time:

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

SCOC-1102-08

Cooler Receipt And Preservation Check Form

Project/Client URS Submission Number R2738014

Cooler received on 6/7/07 by: CM COURIER: CAS UPS (FEDEX) VELOCITY CLIENT

1.	Were custody seals on outside of cooler?	(YES)	NO	
2.	Were custody papers properly filled out (ink, signed, etc.)?	(YES)	NO	
3.	Did all bottles arrive in good condition (unbroken)?	(YES)	NO	
4.	Did any VOA vials have significant air bubbles?	YES	NO	(N/A)
5.	Were **Ice** or **Ice packs** present?	(YES)	NO	
6.	Where did the bottles originate?	(CAS/ROC,)	CLIENT	
7.	Temperature of cooler(s) upon receipt:	4		

Is the temperature within 0° - 6° C?:	(Yes)	Yes	Yes	Yes	Yes
If No, Explain Below	No	No	No	No	No

Date/Time Temperatures Taken: 6/7/07 1005

Thermometer ID: 161 or (IR GUN) Reading From: Temp Blank or (Sample Bottle)

If out of Temperature, Client Approval to Run Samples _____

PC Secondary Review: _____

Cooler Breakdown: Date: 6/7/07 by: _____

1.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
2.	Did all bottle labels and tags agree with custody papers?	YES	NO
3.	Were correct containers used for the tests indicated?	(YES)	NO
4.	Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated		(N/A)

Explain any discrepancies: _____

		YES	NO	Sample I.D.	Reagent	Vol. Added	Final pH
pH	Reagent						
≥12	NaOH						
≤2	HNO_3						
≤2	H_2SO_4						
Residual Chlorine (+/-)	for TCN & Phenol						

YES = All samples OK NO = Samples were preserved at lab as listed PC OK to adjust pH _____

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2		

Other Comments:

PC Secondary Review: _____

DATA VALIDATION REPORT - Level III Review

SDG No.: R2739859 **Fraction:** Perchlorate

Lab: Columbia Analytical Services **Project Name** Radford SWMU 54

Reviewer: RA **Date:** October 17, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable for their intended purpose based on the data reviewed.

Signed: Rayem

SDG #:54MW9
SUBMISSION R2739859
CLIENT: URS Corp.
CLIENT REP: Michael Perry
PROJECT: RFAAD-SWMU54-QTR 4

BATCH COMPLETE: __yes_____
DISKETTE REQUESTED: Y_X__ N____
DATE: 09/24/07
CUSTODY SEAL: PRESENT
CHAIN OF CUSTODY: PRESENT

DATE REVISED:
DATE DUE: 10/12/07
PROTOCOL: SW846
SHIPPING No.:

CAS JOB #	CLIENT/EPA ID	MATRIX	REQUESTED PARAMETERS	DATE SAMPLED	DATE RECEIVED	pH (SOLIDS)	% SOLIDS	REMARKS SAMPLE CONDITION
1038753	54MW9	WATER	Perchlorate by 6850	9/18/2007	9/21/07			
1038754	54MW8	WATER	Perchlorate by 6850	9/18/2007	9/21/07			
1038755	54MW10	WATER	Perchlorate by 6850	9/18/2007	9/21/07			
1038756	54MW3	WATER	Perchlorate by 6850	9/18/2007	9/21/07			
1038757	54MW2 +QC	WATER	Perchlorate by 6850	9/19/2007	9/21/07			
1038758	54MW5	WATER	Perchlorate by 6850	9/19/2007	9/21/07			
1038759	54MW7	WATER	Perchlorate by 6850	9/19/2007	9/21/07			
1038760	54MW4	WATER	Perchlorate by 6850	9/19/2007	9/21/07			
1038761	54MW1	WATER	Perchlorate by 6850	9/19/2007	9/21/07			
1038762	54MW6	WATER	Perchlorate by 6850	9/19/2007	9/21/07			
1038763	EQBK-1	WATER	Perchlorate by 6850	9/19/2007	9/21/07			
1038765	DUP-1	WATER	Perchlorate by 6850	9/19/2007	9/21/07			

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2005 SEAL OF EXCELLENCE PROGRAM

ORGANIC QUALIFIERS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds, or when the data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit and greater than the MDL. This flag is also used for DoD instead of "P" as indicated below.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search.

P - This flag is used for a pesticide/Aroclor target analyte when there is a greater than 40% (25% for CLP) difference for detected concentrations between the two GC columns. The concentration is reported on the Form I and flagged with a "P" ("J" for DoD).

Q - for DoD only – indicates a pesticide/Aroclor target is not confirmed. This flag is used when there is ≥ 100% difference for the detected concentrations between the two GC columns.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and ALL concentration values reported on that Form I are flagged with the "D" flag.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - As specified in Case Narrative.

* - This flag identifies compounds associated with a quality control parameter which exceeds laboratory limits.

CAS/Rochester Lab ID # for State Certifications

NELAP Accredited
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Illinois ID #200047
Maine ID #NY0032
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited
New Jersey ID # NY004
New York ID # 10145
New Hampshire ID # 294100 A/B
Pennsylvania ID# 68-786
Rhode Island ID # 158
West Virginia ID # 292

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : 54MW9

Date Sampled : 09/18/07 14:05 **Order #:** 1038753 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : 54MW8

Date Sampled : 09/18/07 15:30 **Order #:** 1038754 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.37	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : 54MW10

Date Sampled : 09/18/07 16:40 **Order #:** 1038755 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	2.9	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : 54MW3

Date Sampled : 09/19/07 09:18 **Order #:** 1038756 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.31	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : 54MW2

Date Sampled : 09/19/07 10:37 **Order #:** 1038757 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.57	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : 54MW5

Date Sampled : 09/19/07 11:35 **Order #:** 1038758 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.34	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : 54MW7

Date Sampled : 09/19/07 12:32 **Order #:** 1038759 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : 54MW4

Date Sampled : 09/19/07 13:43 **Order #:** 1038760 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : 54MW1

Date Sampled : 09/19/07 14:43 **Order #:** 1038761 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : 54MW6

Date Sampled : 09/19/07 16:35 **Order #:** 1038762 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.10 J	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : EQBK-1

Date Sampled : 09/19/07 16:48 **Order #:** 1038763 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

COLUMBIA ANALYTICAL SERVICES

EXTRACTABLE ORGANICS
METHOD 6850
Reported: 10/10/07

URS Corp.
Project Reference: RFAAD-SWMU54-QTR 4
Client Sample ID : DUP-1

Date Sampled : 09/19/07 : **Order #:** 1038765 **Sample Matrix:** WATER
Date Received: 09/21/07 **Submission #:** R2739859 **Analytical Run** 150878

ANALYTE	MDL	PQL	RESULT	UNITS
DATE EXTRACTED : 09/24/07				
DATE ANALYZED : 09/24/07				
ANALYTICAL DILUTION: 1.00				
PERCHLORATE	0.080	0.20	0.20 U	UG/L

DATA VALIDATION WORKSHEET

Perchlorate

Reviewer: RA
Date: 10/17/07
DV Level: II (III) IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford Sump 54
Project Number: 11657073.20000
Laboratory: Columbia Analytical
SDG No.: R2739859
Test Name: Perchlorate
Method No.: 6850

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	
1.4	Do sample preservation, collection and storage condition meet method requirement?	✓		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC?	✓		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample collection, preservation, shipping, and storage condition meet the project controlling documents?	✓		
	Action: No chemical preservation required.			✓
2.2	Have any technical holding times (28 days), determined from date of sampling to date of analysis, (including dilution or reanalysis) been exceeded? If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks prepared at the appropriate frequency? If not, note in DV report.	✓		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the [sample]≤ 5X[associated blank].		✓	
3.3	Do any field equipment blanks blanks have positive results? If Yes, use same rules above.		✓	

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve?If no apply R flags.	✓		
4.2	Are all initial calibration correlation coefficient within the control limits (r>0.99)?If no J(+), R (-)	✓		
4.3	Was an ICV analyzed and are %RSDs < 15%? If no J(+), UJ(-)	✓		
4.4	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Are %Ds < 25%. If no, R (-), J (+).	✓		

Notes:

5.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
5.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
5.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
5.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?(75-125% for water and soil)		✓	
5.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (i.e., 15%)?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data.			

Notes:

6.0 Laboratory Control Sample(LCS)		Yes	No	NA
6.1	Is the LCS recovery form present?	✓		
6.2	Was LCS analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Is the %R for LCS outside the QC limits(85-115% for water and soil)? If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).		✓	
6.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits(i.e., 15%)? If Yes, J(+) only.		✓	

Notes:

7.0 Field Duplicate		Yes	No	NA
7.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
	For sample results > 5 x RL, use 50% RPD. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 x RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV	✓	✓	

Notes: S4MW7 and DUP-1
ND ND

8.0 Laboratory Duplicates		Yes	No	NA
8.1	Was a lab duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	✓		
8.2	Are all analyte duplicate results within control limits (i.e., RPD < 15%)? If no, J(+) only.	✓		

Notes:

9.0 Internal Standards		Yes	No	NA
9.1	Are internal standard areas of every sample and blank within +/-30% of the ICV or CCV? If no, J(+), UJ(-)	✓		
	If the IS area count criteria is not met, corrective action should be taken to resolve the problem and the entire batch should			
	be re-analyzed.			✓

10.0 Detection Limit Verification		Yes	No	NA
10.1	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	✓		
10.2	Were sample concentrations above the highest standard run at a dilution? If not, note in DV report.			✓

Notes:

11.0 Data Completeness		Yes	No	NA
11.1	Is % completeness within the control limits? (Control limit 90%)	✓		
11.2	Number of samples:			
11.3	Number of target compounds in each analysis:			
11.4	Number of results rejected and not reported:			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = 100%			

Notes:

CASE NARRATIVE
COMPANY: URS
PROJECT: RFAAD-SWMU 54-QTR 4
SUBMISSION #: R2739859

Samples were collected on 09/18/07 – 9/19/07 and received at CAS/Rochester on 09/21/07 in good condition at a cooler temperature of 2 °C. A Level 4 Data package has been delivered.

PERCHLORATE ANALYSIS

Twelve water samples were analyzed for Perchlorate by LC/MS method 6850 with DOD modifications from the DOD Perchlorate Handbook. Values detected between the MDL and PQL have been flagged with a "J" as estimated.

All the initial and continuing calibration criteria were met for all analytes.

Site-specific QC was done on sample 54MW2. The recoveries and RPD were within QC limits. The Blank Spike (LCS) and LODV spike recoveries were within QC limits.

The Laboratory Blank associated with these samples was free of contamination.

No other analytical or QC problems were encountered.

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CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

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SH #

CAS Contact

Project Name: RFAAP-SWMU 54 - Qtr 4	Project Number: 11656351.30015
Project Manager: Tina DeVine	Report CC: Roshanak Aryan
Company/Address: URS Corporation, 5540 Falmouth Street, Suite 201, Richmond VA 23230	
Phone #: (804) 965-9000	FAX#: (804) 965-9764
Sampler's Signature	Sampler's Printed Name: Tina DeVine/James Carter

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

PRESERVATIVE

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624 ☐ CLP	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ CLP	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES ☐ 8081 ☐ 608 ☐ CLP	PCB's ☐ 8082 ☐ 608 ☐ CLP	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	Perchlorate (6850							REMARKS/ ALTERNATE DESCRIPTION
54MW09		9/18/07	14:05	GW	1								X							
54MW08		9/18/07	15:30	GW	1								X							
54MW10		9/18/07	16:40	GW	1								X							
54MW3		9/19/07	9:18	GW	1								X							
54MW2		9/19/07	10:37	GW	1								X							
54MW5		9/19/07	11:35	GW	1								X							
54MW2MS		9/19/07	10:37	GW	1								X							
54MW2MSD		9/19/07	10:37	GW	1								X							
54MW07		9/19/07	12:32	GW	1								X							
DUP-1		9/19/07	—	GW	1								X							

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
___ RUSH (SURCHARGES APPLY)
___ 24 hr ___ 48 hr ___ 5 day
X STANDARD
REQUESTED FAX DATE
REQUESTED REPORT DATE

REPORT REQUIREMENTS
___ I. Results Only
___ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
___ III. Results + QC and Calibration Summaries
X IV. Data Validation Report with Raw Data
___ V. Specialized Forms / Custom Report
Edata X Yes ___ No GISKey

INVOICE INFORMATION
PO#
BILL TO:
R2739259
SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: 2°C CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Kelly M. Cook	Signature	Gregory LaFave	Signature	Signature
Printed Name: Tina DeVine	Printed Name: K. Cook	Printed Name	Printed Name: CAS	Printed Name	Printed Name
Firm: URS Corp	Firm: 9/21/07 940	Firm	Firm: 9/21/07 9:40	Firm	Firm
Date/Time: 9/20/07 19:30	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

SCOC-1102-08

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

9/20/07 12:30

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

Columbia Analytical Services, INC.
An Employee - Owned Company
www.caslab.com

One Mustard St., Suite 250 • Rochester, NY 14609-0859 • (585) 288-5380 • 800-695-7222 x11 • FAX (585) 288-8475 PAGE 2 OF 2

SR #

CAS Contact

Project Name: RFAAP-SWMU 31 - Qtr 4	Project Number: 11656351.30015
Project Manager: Tina DeVine	Report CC: Roshanak Aryan
Company/Address: URS Corporation 5340 Falmouth Street, Suite 201 Richmond, VA 23233	
Phone #: (804) 965-9000	FAX#: (804) 965-9764
Sampler's Signature:	Sampler's Printed Name: Tina DeVine / James Carter

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE: 0

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624 ☐ CLP	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ CLP	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES ☐ 8081 ☐ 608 ☐ CLP	PCB's ☐ 8082 ☐ 608 ☐ CLP	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	Perchlorate (6850)	REMARKS/ ALTERNATE DESCRIPTION
54 MW4		9/19/07	1343	GW	1								X	
54 MW1			1443	GW	1								X	
54 MW6			1635	GW	1								X	
EQBK-1			1648	W	1								X	

Preservative Key
0. NONE
1. HCl
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
_____ **RUSH** (SURCHARGES APPLY)
_____ 24 hr _____ 48 hr _____ 5 day
X **STANDARD**
REQUESTED FAX DATE
_____
REQUESTED REPORT DATE
_____

REPORT REQUIREMENTS
_____ I. Results Only
_____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
_____ III. Results + QC and Calibration Summaries
X IV. Data Validation Report with Raw Data
_____ V. Speicalized Forms / Custom Report
Edata X Yes ___ No Giskey

INVOICE INFORMATION
PO#
BILL TO:
SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: _____ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name: Tina DeVine	Printed Name	Printed Name	Printed Name: Gregory LaFerre	Printed Name	Printed Name
Firm: URS Corp	Firm	Firm	Firm: CAS	Firm	Firm
Date/Time: 9/19/07 19:30	Date/Time: 9/21/07 940	Date/Time	Date/Time: 9/21/07 9:40	Date/Time	Date/Time

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

SCOC-1102-08

Cooler Receipt And Preservation Check Form

Project/Client URS Submission Number R2739859

Cooler received on 9/21/07 by: AP **COURIER:** CAS (UPS) FEDEX VELOCITY CLIENT

1.	Were custody seals on outside of cooler?	(YES)	NO			
2.	Were custody papers properly filled out (ink, signed, etc.)?	YES	NO			
3.	Did all bottles arrive in good condition (unbroken)?	(YES)	NO			
4.	Did any VOA vials have significant air bubbles?	YES	NO	(N/A)		
5.	Were **Ice** or **Ice packs** present?	(YES)	NO			
6.	Where did the bottles originate?	(CAS/ROC), CLIENT				
7.	Temperature of cooler(s) upon receipt:	1.8				
	Is the temperature within 0° - 6° C?:	(Yes)	Yes	Yes	Yes	Yes
	If No, Explain Below	No	No	No	No	No

Date/Time Temperatures Taken: 09/21/07 09:45

Thermometer ID: 161 or (IR GUN) Reading From: Temp Blank or (Sample Bottle)

If out of Temperature, Client Approval to Run Samples _____

PC Secondary Review: MM 9/21/07

Cooler Breakdown: Date: 9/21/07 by: AMA

1.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
2.	Did all bottle labels and tags agree with custody papers?	(YES)	NO
3.	Were correct containers used for the tests indicated?	(YES)	NO
4.	Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated		(N/A)

Explain any discrepancies: _____

		YES	NO	Sample I.D.	Reagent	Vol. Added	Final pH
pH	Reagent						
≥12	NaOH						
≤2	HNO_3						
≤2	H_2SO_4						
Residual Chlorine (+/-)	for TCN & Phenol						

YES = All samples OK NO = Samples were preserved at lab as listed PC OK to adjust pH _____

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2		

Other Comments:

PC Secondary Review: _____

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-330 **Fraction:** Dioxin/Furan

Lab: Paradigm Analytical **Project Name** SWMU54

Reviewer: RA **Date:** March 7, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The method blank displayed positive detections for OCDD at 0.0168 ng/L and 1,2,3,4,6,7,8-HpCDD at 0.00346 ng/L. The associated positive field sample results for OCDD were less than ten times the method blank concentration and were flagged "B,z." Equipment blank, EQBK-1 located in SDG G296-333 displayed positive detections for 1,2,3,4,6,7,8-HpCDD at 0.00119 ng/L, 1,2,3,7,8-PeCDF at 0.000651 ng/L, and 2,3,4,7,8-PeCDF at 0.000782 ng/L. The associated field sample results were non-detects and no data qualifying action was necessary.

The ongoing precision result (OPR) displayed a percent recovery greater than the upper control limit of 130% for OCDF at 133%. The associated field sample results were non-detects and no data qualifying action was necessary.

The OPR and OPRD displayed percent recoveries less than the lower control limit of 40% for the extraction standard 13C12-OCDD at 31.4% and 35.6%, respectively. These are quality control samples, and no data qualifying action was taken.

Sample 54MW2 displayed a detection reported by the laboratory as estimated maximum possible concentration (EMPC). This EMPC displayed an ion abundance ratio outside the method criterion of a theoretical ratio +/- 15% but within the EPA Region III criterion of +/- 25%, and was qualified as "J,w".

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method with the exception of anomalies discussed above. All data are usable as qualified for their intended purpose based on the data reviewed.

Signed: Rayam

Radford SWMU 54
G296-330

G296-330-1	**54MW2**
G296-330-2	**54MW2 MS**
G296-330-3	**54MW2 MSD**
G296-330-4	**54MW1**

Method 8290
54MW2
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.00425					
1,2,3,7,8-PeCDD	ND	0.00260					
1,2,3,4,7,8-HxCDD	ND	0.00260					
1,2,3,6,7,8-HxCDD	ND	0.00260					
1,2,3,7,8,9-HxCDD	ND	0.00260					
1,2,3,4,6,7,8-HpCDD	ND	0.00355					
OCDD	0.00696 B,Z			43:07	0.89		A
2,3,7,8-TCDF	ND	0.00226					
1,2,3,7,8-PeCDF	ND	0.00260					
2,3,4,7,8-PeCDF	EMPC	0.00260	0.00100 J,W	33:25	1.26	*	A
1,2,3,4,7,8-HxCDF	ND	0.00260					
1,2,3,6,7,8-HxCDF	ND	0.00260					
2,3,4,6,7,8-HxCDF	ND	0.00260					
1,2,3,7,8,9-HxCDF	ND	0.00260					
1,2,3,4,6,7,8-HpCDF	ND	0.00260					
1,2,3,4,7,8,9-HpCDF	ND	0.00260					
OCDF	ND	0.00521					
Total TCDDs	ND	0.00425					
Total PeCDDs	ND	0.00260					
Total HxCDDs	ND	0.00260					
Total HpCDDs	ND	0.00355					
Total TCDFs	ND	0.00226					
Total PeCDFs	ND	0.00260	0.00100				
Total HxCDFs	ND	0.00260					
Total HpCDFs	ND	0.00260					
WHO-2005 TEQ (ND=0)	0.00000209		0.000302				
WHO-2005 TEQ (ND=½)	0.00493		0.00484				

Client Information			**Sample Information**		
Project Name:	SWMU 54		Report Basis:		
			Matrix:	Water	
Sample ID:	54MW2		Weight / Volume:	960 mL	
			Solids / Lipids:	NA	%
			Original pH :	6	
Laboratory Information			Batch ID:	WG14022	
Project ID:	G296-330		Instrument:	HRMS1	
Sample ID:	G296-330-1B		Filename:	a19dec06a_2-4	
Collection Date/Time:	11/29/06	15:05	Retchk:	a19dec06a-15	
Receipt Date/Time:	11/30/06	10:10	Begin ConCal:	a19dec06a-15	
Extraction Date:	12/17/06		End ConCal:	a19dec06a_2-14	
Analysis Date/Time:	12/20/06	2:14	Initial Cal:	m8290-071006e	

Method 8290
54MW2
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.20	60.1	30:19	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.48	74.2	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.78	89.0	36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.47	73.7	39:12	1.04	
13C12-OCDD	4.0	2.11	52.6	43:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.50	74.9	29:24	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.24	62.1	32:48	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.67	83.5	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.51	75.6	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.332	82.9	30:22	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.331	82.8	33:24	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.310	77.5	36:01	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.336	84.0	35:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.288	71.9	39:49	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:37	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:21	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	54MW2		Weight / Volume:	960 mL
			Solids / Lipids:	NA %
			Original pH :	6
Laboratory Information			Batch ID:	WG14022
Project ID:	G296-330		Instrument:	HRMS1
Sample ID:	G296-330-1B		Filename:	a19dec06a_2-4
Collection Date/Time:	11/29/06	15:05	Retchk:	a19dec06a-15
Receipt Date/Time:	11/30/06	10:10	Begin ConCal:	a19dec06a-15
Extraction Date:	12/17/06		End ConCal:	a19dec06a_2-14
Analysis Date/Time:	12/20/06	2:14	Initial Cal:	m8290-071006e

Form Version [8290_DB_2.07]Report

Analyzed by: HMP
Date: 20Dec06

Reviewed by: CRL
Date: 12/20/06

Method 8290
54MW1
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00459				
1,2,3,7,8-PeCDD	ND	0.00259				
1,2,3,4,7,8-HxCDD	ND	0.00259				
1,2,3,6,7,8-HxCDD	ND	0.00259				
1,2,3,7,8,9-HxCDD	ND	0.00259				
1,2,3,4,6,7,8-HpCDD	ND	0.00336				
OCDD	0.00589 B	12		43:07	0.81	A
2,3,7,8-TCDF	ND	0.00267				
1,2,3,7,8-PeCDF	ND	0.00259				
2,3,4,7,8-PeCDF	ND	0.00259				
1,2,3,4,7,8-HxCDF	ND	0.00259				
1,2,3,6,7,8-HxCDF	ND	0.00259				
2,3,4,6,7,8-HxCDF	ND	0.00259				
1,2,3,7,8,9-HxCDF	ND	0.00259				
1,2,3,4,6,7,8-HpCDF	ND	0.00259				
1,2,3,4,7,8,9-HpCDF	ND	0.00259				
OCDF	ND	0.00661				
Total TCDDs	ND	0.00459				
Total PeCDDs	ND	0.00259				
Total HxCDDs	ND	0.00259				
Total HpCDDs	ND	0.00336				
Total TCDFs	ND	0.00267				
Total PeCDFs	ND	0.00259				
Total HxCDFs	ND	0.00259				
Total HpCDFs	ND	0.00259				
WHO-2005 TEQ (ND=0)	0.00000177		0.00000177			
WHO-2005 TEQ (ND=½)	0.00510		0.00510			

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	54MW1		Weight / Volume:	967 mL
			Solids / Lipids:	NA %
			Original pH :	6
Laboratory Information			Batch ID:	WG14022
Project ID:	G296-330		Instrument:	HRMS1
Sample ID:	G296-330-4C		Filename:	a19dec06a_2-7
Collection Date/Time:	11/29/06	13:55	Retchk:	a19dec06a-15
Receipt Date/Time:	11/30/06	10:10	Begin ConCal:	a19dec06a-15
Extraction Date:	12/17/06		End ConCal:	a19dec06a_2-14
Analysis Date/Time:	12/20/06	4:35	Initial Cal:	m8290-071006e

Method 8290
54MW1
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.15	57.4	30:19	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.37	68.7	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.64	82.2	36:07	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.43	71.4	39:12	1.05	
13C12-OCDD	4.0	1.91	47.6	43:07	0.90	
13C12-2,3,7,8-TCDF	2.0	1.46	73.2	29:24	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.16	57.9	32:48	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.42	71.2	35:27	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.40	70.1	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.328	82.0	30:22	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.338	84.4	33:24	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.292	73.0	36:01	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.321	80.2	35:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.285	71.2	39:49	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:37	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:21	1.26	

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	54MW1		Weight / Volume:	967 mL
			Solids / Lipids:	NA %
			Original pH :	6
Laboratory Information			Batch ID:	WG14022
Project ID:	G296-330		Instrument:	HRMS1
Sample ID:	G296-330-4C		Filename:	a19dec06a_2-7
Collection Date/Time:	11/29/06	13:55	Retchk:	a19dec06a-15
Receipt Date/Time:	11/30/06	10:10	Begin ConCal:	a19dec06a-15
Extraction Date:	12/17/06		End ConCal:	a19dec06a_2-14
Analysis Date/Time:	12/20/06	4:35	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.07]Report

Analyzed by: HMP
Date: 20Dec06

Reviewed by: CRP
Date: 12/22/06

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: RA
Date: 12/27/06
DV Level: II (III) IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002) X NFG Region III Draft Guidance (March 1999)

Project Name: Radford SWMU54
Project Number: 11654351.30007
Laboratory: SGS
SDG No.: G296-330
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B". (use 10X for OCDD/OCDF data) TEQ values should not be calculated for isomers flagged B.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	✓		✓

Notes: MB → OCDD at 0.0168 ng/L and 1,2,3,4,6,7,8-HpCDD at 0.00346 ng/L
and dojap HpCDD-2 at 0.00346

EQ. blank, EQBK-1 in SDG G296-333
1,2,3,4,6,7,8-HpCDD 0.00119 ng/L
1,2,3,7,8-PeCDF 0.000651 ng/L) NDs, No action

Lowest B, 2 in both samples.
10

NDs in both.

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-"; by greater than 50%, "J+/R-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.	✓		
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "N+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits	
4	M/M+2	0.77	0.65- 0.89	
5	M+2/M+4	1.55	1.32- 1.78	
6	M+2/M+2	1.24	1.05- 1.43	
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	
~~7~~	~~M+2/M+4~~	~~1.04~~	~~0.88- 1.20~~	N/A for APPIX
~~8~~	~~M+2~~	~~0.89~~	~~0.76- 1.02~~	N/A for APPIX

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓		

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed at the same frequency as calibrations that defines descriptor switching times of scan ranges? If not, make a note in DV Report.	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≤ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?		✓	
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?	✓		
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes: OPR [redacted] 130%. for OCDF 133%. [redacted]

Both NDs in the samples, No action

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	✓		
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		
8.3	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	✓		

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓		
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.	✓		
10.4	Is the signal to noise ≥ 2.5 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥ 2.5 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Are the two identification peak apexs within 2 seconds for positive identifications? If not, result is reported as non-detect,	✓		
10.7	Are polychlorinated diphenyl ether (PCDPE) interferences in the PCDPE channel with a S/N ratio > 2.5 and with a RT within ± 2 seconds? If yes, qualify positive furan results I.	✓		
10.8	Was a second column confirmation used for positive 2,3,7,8-TCDF?			✓
	If no, apply "R" to the positive 2,3,7,8-TCDF results.			
	If yes, calculate the %D between the two column results, report the lower of the two values if the %D is > 25% and qualify J.			
10.9	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.			✓
10.10	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes:

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
11.1	Are Isotopic ratios for a detected analyte within the following established control limits...?	✓		

# Cl ion atoms	Ion Type	Theoretical	Control Limits	RIII Expanded Limits
4	M/M+2	0.77	0.65- 0.89	0.58- 0.96
5	M+2/M+4	1.55	1.32- 1.78	1.16- 1.94
6	M+2/M+2	1.24	1.05- 1.43	0.93- 1.55
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	0.38- 0.64
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	0.33- 0.55
7	M+2/M+4	1.04	0.88- 1.2	0.78- 1.30
8	M+2	0.89	0.76- 1.02	0.67- 1.11

For positive field sample results with ion abundance ratios outside the method control limits but within the expanded RIII limits, The laboratory should report the concentration as an estimated maximum possible concentration (EMPC). Region III requires this type of result to be reported as true PCDD/PCDF isomer. The validator shall also qualify J.

For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.

For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).

11.2	RIII separates 2,3,7,8-chlorinated isomers from total isomers for each congener group and reports results as 2,3,7,8-chlorine substituted and 'Other Total' PCDD/PCDF isomers. If laboratory did not report these separate, make a note in the DV report.	✓		

Notes:

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%.			

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.00570					
1,2,3,7,8-PeCDD	EMPC	0.00250	0.00138	33:36	1.26	*	A
1,2,3,4,7,8-HxCDD	ND	0.00272					
1,2,3,6,7,8-HxCDD	ND	0.00282					
1,2,3,7,8,9-HxCDD	ND	0.00275					
1,2,3,4,6,7,8-HpCDD	0.00346			39:12	1.16		A
OCDD	0.0168			43:07	0.90		A
2,3,7,8-TCDF	ND	0.00283					
1,2,3,7,8-PeCDF	EMPC	0.00250	0.00184	32:48	1.05	*	A
2,3,4,7,8-PeCDF	EMPC	0.00250	0.00190	33:25	1.22	*	A
1,2,3,4,7,8-HxCDF	ND	0.00263					
1,2,3,6,7,8-HxCDF	ND	0.00252					
2,3,4,6,7,8-HxCDF	ND	0.00261					
1,2,3,7,8,9-HxCDF	ND	0.00296					
1,2,3,4,6,7,8-HpCDF	ND	0.00299					
1,2,3,4,7,8,9-HpCDF	ND	0.00372					
OCDF	ND	0.0108					
Total TCDDs	ND	0.00570					
Total PeCDDs	ND	0.00250	0.00138				
Total HxCDDs	ND	0.00282					
Total HpCDDs	0.00346						
Total TCDFs	ND	0.00283					
Total PeCDFs	ND	0.00250	0.00374				
Total HxCDFs	ND	0.00296					
Total HpCDFs	ND	0.00372					
WHO-2005 TEQ (ND=0)	0.0000396		0.00204				
WHO-2005 TEQ (ND=½)	0.00568		0.00602				

Client Information			**Sample Information**	
Project Name:			Report Basis:	
			Matrix:	Water
Sample ID:	Lab Method Blank		Weight / Volume:	1000 mL
			Solids / Lipids:	NA %
			Original pH :	5
Laboratory Information			Batch ID:	WG14022
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a19dec06a_2-3
Collection Date/Time:			Retchk:	a19dec06a-15
Receipt Date/Time:			Begin ConCal:	a19dec06a-15
Extraction Date:	12/17/06		End ConCal:	a19dec06a_2-14
Analysis Date/Time:	12/20/06	1:26	Initial Cal:	m8290-071006e

Method 8290
Lab Method Blank

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.03	51.3	30:19	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.24	62.0	33:34	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.60	80.2	36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.40	69.9	39:12	1.05	
13C12-OCDD	4.0	1.65	41.4	43:07	0.90	
13C12-2,3,7,8-TCDF	2.0	1.36	67.9	29:24	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.03	51.6	32:48	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.28	64.2	35:28	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.31	65.3	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.331	82.8	30:22	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.341	85.2	33:24	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.368	92.0	36:01	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.338	84.6	35:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.292	73.0	39:49	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:37	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:21	1.25	

Client Information			**Sample Information**	
Project Name:			Report Basis:	
			Matrix:	Water
Sample ID:	Lab Method Blank		Weight / Volume:	1000 mL
			Solids / Lipids:	NA %
			Original pH :	5
Laboratory Information			Batch ID:	WG14022
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a19dec06a_2-3
Collection Date/Time:			Retchk:	a19dec06a-15
Receipt Date/Time:			Begin ConCal:	a19dec06a-15
Extraction Date:	12/17/06		End ConCal:	a19dec06a_2-14
Analysis Date/Time:	12/20/06	1:26	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.07]Report

Analyzed by: UMP
Date: 20Dec06

Reviewed by: [signature]
Date: 12/20/06

Method 8290
EQBK-1
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00112				
1,2,3,7,8-PeCDD	ND	0.00271				
1,2,3,4,7,8-HxCDD	ND	0.00271				
1,2,3,6,7,8-HxCDD	ND	0.00271				
1,2,3,7,8,9-HxCDD	ND	0.00271				
1,2,3,4,6,7,8-HpCDD	0.00119			39:13	1.11	A
OCDD	0.00782	B/Z		43:07	0.82	A
2,3,7,8-TCDF	ND	0.000608				
1,2,3,7,8-PeCDF	0.000651			32:48	1.66	A
2,3,4,7,8-PeCDF	0.000782			33:24	1.58	A
1,2,3,4,7,8-HxCDF	ND	0.00271				
1,2,3,6,7,8-HxCDF	ND	0.00271				
2,3,4,6,7,8-HxCDF	ND	0.00271				
1,2,3,7,8,9-HxCDF	ND	0.00271				
1,2,3,4,6,7,8-HpCDF	ND	0.00271				
1,2,3,4,7,8,9-HpCDF	ND	0.00271				
OCDF	ND	0.00543				
Total TCDDs	ND	0.00112				
Total PeCDDs	ND	0.00271				
Total HxCDDs	ND	0.00271				
Total HpCDDs	0.00221					
Total TCDFs	ND	0.000608				
Total PeCDFs	0.00143					
Total HxCDFs	ND	0.00271				
Total HpCDFs	ND	0.00271				
WHO-98 TEQ (ND=0)	0.000436		0.000436			
WHO-98 TEQ (ND=½)	0.00336		0.00336			

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	EQBK-1		Weight / Volume:	921 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-333		Instrument:	HRMS1
Sample ID:	G296-333-2C		Filename:	a17dec06a_3-6
Collection Date/Time:	11/29/06	17:15	Retchk:	a17dec06a_2-14
Receipt Date/Time:	12/01/06	12:00	Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	14:02	Initial Cal:	m8290-071006e

Analytical Results
for
Ongoing Precision Result (OPR)

Analyte	Spiked (pg/µL)	AMT (pg/µL)	REC %	Range % Lower	Range % Upper	Qualifier
2,3,7,8-TCDD	10	10.8	108	70.0	130	
1,2,3,7,8-PeCDD	50	48.9	97.8	70.0	130	
1,2,3,4,7,8-HxCDD	50	46.2	92.4	70.0	130	
1,2,3,6,7,8-HxCDD	50	54.8	110	70.0	130	
1,2,3,7,8,9-HxCDD	50	49.9	99.8	70.0	130	
1,2,3,4,6,7,8-HpCDD	50	49.6	99.2	70.0	130	
OCDD	100	95.9	95.9	70.0	130	
2,3,7,8-TCDF	10	8.41	84.1	70.0	130	
1,2,3,7,8-PeCDF	50	54.6	109	70.0	130	
2,3,4,7,8-PeCDF	50	61.2	122	70.0	130	
1,2,3,4,7,8-HxCDF	50	46.4	92.8	70.0	130	
1,2,3,6,7,8-HxCDF	50	53.4	107	70.0	130	
2,3,4,6,7,8-HxCDF	50	52.7	105	70.0	130	
1,2,3,7,8,9-HxCDF	50	44.7	89.4	70.0	130	
1,2,3,4,6,7,8-HpCDF	50	53.3	107	70.0	130	
1,2,3,4,7,8,9-HpCDF	50	47.3	94.6	70.0	130	
OCDF	100	133	133	70.0	130	#

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Project No:	OPR14022
Extraction Date:	17-Dec-06
Analysis Date:	19-Dec-06
Method:	8290

Sample Information

Matrix:	Water

File Information

OPR Filename:	a19dec06a_2-1
Retchk:	a19dec06a-15
Begin ConCal:	a19dec06a-15
End ConCal:	a19dec06a_2-14
Initial Cal:	m8290-071006e

Analytical Results
for
Ongoing Precision Result (OPR)

(40-135%)

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2	1.01	50.6	30:19	0.79	
13C12-1,2,3,7,8-PeCDD	2	1.51	75.5	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2	1.67	83.7	36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2	1.45	72.7	39:12	1.04	
13C12-OCDD	4	1.26	31.4 #	43:07	0.88	
13C12-2,3,7,8-TCDF	2	1.29	64.5	29:24	0.79	
13C12-1,2,3,7,8-PeCDF	2	1.13	56.4	32:48	1.57	
13C12-1,2,3,6,7,8-HxCDF	2	1.42	71.2	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2	1.30	65.0	38:01	0.45	
Cleanup Standards			(70-130%)			
37Cl4-2,3,7,8-TCDD	0.4	0.324	81.1	30:22	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.384	96.0	33:24	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.328	81.9	36:01	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.348	87.0	35:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.293	73.1	39:49	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2	-	-	29:37	0.79	
13C12-1,2,3,7,8,9-HxCDD	2	-	-	36:21	1.24	

QC Information

OPR Project No:	OPR14022
Extraction Date:	17-Dec-06
Analysis Date:	19-Dec-06
Method:	8290

Sample Information

Matrix:	Water

File Information

OPR Filename :	a19dec06a_2-1
Retchk:	a19dec06a-15
Begin ConCal:	a19dec06a-15
End ConCal:	a19dec06a_2-14
Initial Cal:	m8290-071006e

Form Version:[8290_DB_2 07]OPR

Reviewed By: _____ Date Reviewed: 12/20/06

Analytical Results
for
Ongoing Precision & Recovery Duplicate Results (OPRD)

Analyte	Spiked (pg/µL)	AMT (pg/µL)	Recovery %	#	Range Lower	Range Upper	OPR Rec(%)	#	RPD (±20%)	Qualifier
2,3,7,8-TCDD	10.0	10.6	106		70.0	130	108		2.05	
1,2,3,7,8-PeCDD	50.0	49.2	98.4		70.0	130	97.8		0.573	
1,2,3,4,7,8-HxCDD	50.0	47.7	95.5		70.0	130	92.4		3.24	
1,2,3,6,7,8-HxCDD	50.0	53.7	107		70.0	130	110		2.44	
1,2,3,7,8,9-HxCDD	50.0	49.3	98.5		70.0	130	99.8		1.29	
1,2,3,4,6,7,8-HpCDD	50.0	49.4	98.7		70.0	130	99.2		0.470	
OCDD	100	94.8	94.8		70.0	130	95.9		1.11	
2,3,7,8-TCDF	10.0	8.59	85.9		70.0	130	84.1		2.11	
1,2,3,7,8-PeCDF	50.0	54.7	109		70.0	130	109		0.404	
2,3,4,7,8-PeCDF	50.0	59.1	118		70.0	130	122		3.24	
1,2,3,4,7,8-HxCDF	50.0	46.3	92.6		70.0	130	92.8		0.233	
1,2,3,6,7,8-HxCDF	50.0	53.8	108		70.0	130	107		0.571	
2,3,4,6,7,8-HxCDF	50.0	50.3	101		70.0	130	105		4.28	
1,2,3,7,8,9-HxCDF	50.0	42.9	85.7		70.0	130	89.4		4.27	
1,2,3,4,6,7,8-HpCDF	50.0	53.5	107		70.0	130	107		0.0917	
1,2,3,4,7,8,9-HpCDF	50.0	46.0	92.1		70.0	130	94.6		2.76	
OCDF	100	128	128		70.0	130	133	#	3.70	

= Outside range limits
= Ion Ratio Out

QC Information

QPR Project No: OPRD14022
Extraction Date: 17-Dec-06
Analysis Date: 20-Dec-06
Method: 8290

Sample Information

Matrix: Water

File Information

OPRD Filename : a19dec06a_2-2
Retchk: a19dec06a-15
Begin ConCal: a19dec06a-15
End ConCal: a19dec06a_2-14
Initial Cal: m8290-071006e

Analytical Results
for
Ongoing Precision & Recovery Duplicate Results (OPRD)

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)		RT (min.)	Ratio	Qualifier
Extraction Standards			(40-135%)				
13C12-2,3,7,8-TCDD	2	1.17	58.5		30:19	0.79	
13C12-1,2,3,7,8-PeCDD	2	1.49	74.6		33:34	1.57	
13C12-1,2,3,6,7,8-HxCDD	2	1.74	87.1		36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2	1.48	73.8		39:12	1.04	
13C12-OCDD	4	1.42	35.6	#	43:07	0.89	
13C12-2,3,7,8-TCDF	2	1.49	74.7		29:24	0.78	
13C12-1,2,3,7,8-PeCDF	2	1.21	60.6		32:48	1.58	
13C12-1,2,3,6,7,8-HxCDF	2	1.57	78.5		35:27	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2	1.37	68.6		38:01	0.45	
Cleanup Standards			(70-130%)				
37Cl4-2,3,7,8-TCDD	0.4	0.320	80.0		30:21	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.342	85.4		33:24	1.56	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.315	78.7		36:01	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.340	85.0		35:21	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.289	72.3		39:49	0.44	
Injection Standards							
13C12-1,2,3,4-TCDD	2	-	-		29:36	0.80	
13C12-1,2,3,7,8,9-HxCDD	2	-	-		36:21	1.25	

)C Information

)PR Project No:	OPRD14022
xtraction Date:	17-Dec-06
nalysis Date:	20-Dec-06
lethod:	8290

ample Information

latrix:	Water

File Information

OPRD Filename :	a19dec06a_2-2
Retchk:	a19dec06a-15
Begin ConCal:	a19dec06a-15
End ConCal:	a19dec06a_2-14
Initial Cal:	m8290-071006e

Form Version [8290_DB_2 07]OPRD

eviewed By: _____ Date Reviewed: 12/20/06

SGS

Case Narrative
SGS Project: **G296-330**
Project Name: **SWMU 54**

For Method: 8290

- The submitted samples were accepted into the lab on November 30th, 2006 and extracted on December 17th, 2006 by method 3520C. The sample extracts and associated QC extracts were then processed through clean-up by method 3630/3620 and analyzed by HRGC/HRMS for method 8290.
- The OPR associated with workgroup WG14022 has a recovery for OCDF which is above the method QC limits. OCDF was not detected in any of the submitted samples.
- The OPR and the OPRD from WG14022 have recoveries for $^{13}C_{12}$-OCDD which is below the method QC limits.

Craig R. Tronzo 12/21/06
Craig R. Tronzo Date
Data Validation/QA Officer

Secondary Review

W. Mike Larkins Date
Technical Director

Or Heather Patterson 21 Dec 06
Heather Patterson Date
Director

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP[+]
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
[+] Massachusetts Department of Environmental Protection

SGS

List of Qualifiers

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* See case narrative

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation generally results in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

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066293

(1)

CLIENT: URS Corp.

CONTACT: Roshanak Aryan PHONE NO:(804) 965.9000

PROJECT: SWMU 54 ✓ SITE/PWSID# :

REPORTS TO: 5540 Falmouth St. Suite 201 Richmond, VA 23230 E-MAIL: roshanak_aryan@urscorp.com FAX NO.:(804) 965.9764

INVOICE TO: same as above QUOTE # P.O. NUMBER

SGS Reference: G296-330

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP G=GRAB)	Preservatives Used	—	—	Analysis Required (3) 8250	REMARKS
	54MW2 ✓	11/29/06	1505	GW	2	G				X	
	54MW2MS ✓	11/29/06	1505	GW	2	G				X	
	54MW2MSD ✓	11/29/06	1505	GW	2	G				X	
	54MW1 ✓	11/29/06	1355	GW	2	G				X	

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
	11/29/06	1640	
Relinquished By: (2)	Date 11/30/06	Time 1010	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier: Fed Ex

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 2.8°C

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

Standard T.A.T.

200 W. Potter Drive Anchorage, AK 99518 Tel (907) 562-2343 Fax: (907) 561-5301
5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
1270 Greenbrier Street Charleston, WV 25311 Tel. (304) 346-0725 Fax. (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **URS** Lab Proj. ID: **G296-330**

Client Proj. ID: **SWMU 54**

1. X Shipped
   __ Hand Delivered
   Notes:

2. __ Proper, full, and complete documentation
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   X Acceptable documentation (but, incomplete)
   __ Unacceptable documentation
   Notes:

3. X Custody Tape on Container
   __ No Custody Tape
   Notes:

4. X Samples Intact*
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles
   Notes:

5. X Chilled on Receipt* Actual Temp.(s) in °C: 2.8
   __ Ambient on Receipt
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol
   Notes:

6. X Sufficient Sample Submitted
   __ Insufficient Sample Submitted
   Notes:

7. X Samples Preserved Correctly*
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)
   Notes:

8. X Received Within Holding Time
   __ Not Received Within Holding Time
   __ N/A
   Notes:

9. X No Discrepancies Noted
   __ Discrepancies Noted
   Notes:

Comments: Received one liter of 54MW2 empty, bottle is labeled but no sample inside.
Also received a full liter of 54MW2.

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

Inspected and Logged in by: _____

DC27.091503.3 Date / Time: Thu-11/30/06 10:57

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-333 **Fraction:** Dioxin/Furan

Lab: Paradigm Analytical **Project Name** SWMU54

Reviewer: RA **Date:** March 7, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The method blank displayed a positive detection for OCDD at 0.0117 ng/L. The associated positive field sample results for OCDD were less than ten times the method blank concentration and were flagged "B,z." Equipment blank, EQBK-1 displayed positive detections for 1,2,3,4,6,7,8-HpCDD at 0.00119 ng/L, 1,2,3,7,8-PeCDF at 0.000651 ng/L, 2,3,4,7,8-PeCDF at 0.000782 ng/L, total HpCDDs at 0.00221 ng/L, and total PeCDFs at 0.00143 ng/L. Positive associated field sample results less than five times the equipment blank concentrations were flagged "B,x."

Several samples displayed detections reported by the laboratory as estimated maximum possible concentrations (EMPCs). In cases where the EMPC displayed an ion abundance ratio outside the method criterion of a theoretical ratio +/- 15% but within the EPA Region III criterion of +/- 25%, the EMPC was qualified as "J,w". In cases where the EMPC displayed an ion abundance ratio greater than the EPA Region III criterion of +/- 25%, the EMPC was changed to a non-detect.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method with the exception of anomalies discussed above. All data are usable as qualified for their intended purpose based on the data reviewed.

Signed: Rayan

Radford SWMU 54
G296-333

G296-333-1C	**54MW6**
G296-333-2C	**EQBK-1**
G296-333-3C	**54MW4**

Method 8290
54MW6
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.00101					
1,2,3,7,8-PeCDD	0.000948			33:34	1.57		A
1,2,3,4,7,8-HxCDD	ND	0.00258					
1,2,3,6,7,8-HxCDD	ND	0.00258					
1,2,3,7,8,9-HxCDD	ND	0.00258					
1,2,3,4,6,7,8-HpCDD	0.00120 B	2X		39:13	1.13		A
OCDD	0.00765 B, Z			43:07	0.93		A
2,3,7,8-TCDF	ND	0.000569					
1,2,3,7,8-PeCDF	0.000948 B, X			32:48	1.68		A
2,3,4,7,8-PeCDF	0.000907 B	2X		33:24	1.63		A
1,2,3,4,7,8-HxCDF	ND ND	0.00258					
1,2,3,6,7,8-HxCDF	~~EMPC~~	0.00258	~~0.000639~~	35:28	1.59	*	A
2,3,4,6,7,8-HxCDF	0.000619			35:55	1.40		A
1,2,3,7,8,9-HxCDF	0.000763			36:39	1.26		A
1,2,3,4,6,7,8-HpCDF	0.000825			38:01	1.11		A
1,2,3,4,7,8,9-HpCDF	ND	0.00258					
OCDF	0.00130			43:22	0.90		A
Total TCDDs	ND	0.00101					
Total PeCDDs	0.000948						
Total HxCDDs	ND	0.00258					
Total HpCDDs	0.00120	B, X					
Total TCDFs	ND	0.000569					
Total PeCDFs	0.00186 B	2X					
Total HxCDFs	0.00138		0.00202				
Total HpCDFs	0.000825						
WHO-2005 TEQ (ND=0)	0.00141		0.00147				
WHO-2005 TEQ (ND=½)	0.00260		0.00254				

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	54MW6		Weight / Volume:	970 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-333		Instrument:	HRMS1
Sample ID:	G296-333-1C		Filename:	a17dec06a_3-5
Collection Date/Time:	11/29/06	11:00	Retchk:	a17dec06a_2-14
Receipt Date/Time:	12/01/06	12:00	Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	13:15	Initial Cal:	m8290-071006e

VALUE CHANGE

Method 8290
54MW6
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.62	81.0	30:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.82	91.0	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.84	92.0	36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.65	82.7	39:12	1.05	
13C12-OCDD	4.0	2.38	59.6	43:07	0.89	
13C12-2,3,7,8-TCDF	2.0	2.02	101	29:24	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.70	85.0	32:48	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.80	89.8	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.63	81.7	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.345	86.1	30:22	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.347	86.8	33:24	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.351	87.8	36:01	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.355	88.7	35:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.306	76.4	39:49	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:37	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:21	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	54MW6		Weight / Volume:	970 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-333		Instrument:	HRMS1
Sample ID:	G296-333-1C		Filename:	a17dec06a_3-5
Collection Date/Time:	11/29/06	11:00	Retchk:	a17dec06a_2-14
Receipt Date/Time:	12/01/06	12:00	Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	13:15	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2 07]Report

Analyzed by: HMP
Date: 21Dec06

Reviewed by: [illegible]
Date: 12/21/06

Method 8290
EQBK-1
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00112				
1,2,3,7,8-PeCDD	ND	0.00271				
1,2,3,4,7,8-HxCDD	ND	0.00271				
1,2,3,6,7,8-HxCDD	ND	0.00271				
1,2,3,7,8,9-HxCDD	ND	0.00271				
1,2,3,4,6,7,8-HpCDD	0.00119			39:13	1.11	A
OCDD	0.00782	B/Z		43:07	0.82	A
2,3,7,8-TCDF	ND	0.000608				
1,2,3,7,8-PeCDF	0.000651			32:48	1.66	A
2,3,4,7,8-PeCDF	0.000782			33:24	1.58	A
1,2,3,4,7,8-HxCDF	ND	0.00271				
1,2,3,6,7,8-HxCDF	ND	0.00271				
2,3,4,6,7,8-HxCDF	ND	0.00271				
1,2,3,7,8,9-HxCDF	ND	0.00271				
1,2,3,4,6,7,8-HpCDF	ND	0.00271				
1,2,3,4,7,8,9-HpCDF	ND	0.00271				
OCDF	ND	0.00543				
Total TCDDs	ND	0.00112				
Total PeCDDs	ND	0.00271				
Total HxCDDs	ND	0.00271				
Total HpCDDs	0.00221					
Total TCDFs	ND	0.000608				
Total PeCDFs	0.00143					
Total HxCDFs	ND	0.00271				
Total HpCDFs	ND	0.00271				
WHO-2005 TEQ (ND=0)	0.000268		0.000268			
WHO-2005 TEQ (ND=½)	0.00319		0.00319			

Client Information			**Sample Information**		
Project Name:	SWMU 54		Report Basis:		
			Matrix:	Water	
Sample ID:	EQBK-1		Weight / Volume:	921 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14015	
Project ID:	G296-333		Instrument:	HRMS1	
Sample ID:	G296-333-2C		Filename:	a17dec06a_3-6	
Collection Date/Time:	11/29/06	17:15	Retchk:	a17dec06a_2-14	
Receipt Date/Time:	12/01/06	12:00	Begin ConCal:	a17dec06a_2-14	
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14	
Analysis Date/Time:	12/18/06	14:02	Initial Cal:	m8290-071006e	

Method 8290
EQBK-1
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.57	78.3	30:19	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.73	86.4	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.81	90.3	36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.57	78.4	39:12	1.05	
13C12-OCDD	4.0	2.30	57.4	43:06	0.89	
13C12-2,3,7,8-TCDF	2.0	1.98	99.2	29:24	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.61	80.4	32:48	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.77	88.6	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.58	79.0	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.341	85.4	30:22	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.350	87.5	33:24	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.361	90.3	36:01	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.334	83.5	35:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.301	75.2	39:49	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:37	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:21	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	EQBK-1		Weight / Volume:	921 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-333		Instrument:	HRMS1
Sample ID:	G296-333-2C		Filename:	a17dec06a_3-6
Collection Date/Time:	11/29/06	17:15	Retchk:	a17dec06a_2-14
Receipt Date/Time:	12/01/06	12:00	Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	14:02	Initial Cal:	m8290-071006e

Form Version [8290_DB_2 07]Report

Analyzed by: HMP
Date: 21Dec06

Reviewed by: MPL
Date: 12/21/06

Method 8290
54MW4
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.00122					
1,2,3,7,8-PeCDD	0.00168			33:34	1.45		A
1,2,3,4,7,8-HxCDD	ND ~~EMPC~~	0.00265	~~0.00127~~	36:03	1.64	*	A
1,2,3,6,7,8-HxCDD	EMPC	0.00265	0.00127 J,W	36:07	1.43	*	A
1,2,3,7,8,9-HxCDD	0.00121			36:21	1.32		A
1,2,3,4,6,7,8-HpCDD	0.00155 B,X			39:13	1.08		A
OCDD	0.00798 B,Z			43:07	0.84		A
2,3,7,8-TCDF	EMPC	0.000658	0.000510 J,W	29:25	0.91	*	A
1,2,3,7,8-PeCDF	0.00200			32:49	1.38		A
2,3,4,7,8-PeCDF	0.00166			33:24	1.64		A
1,2,3,4,7,8-HxCDF	0.00119			35:22	1.07		A
1,2,3,6,7,8-HxCDF	0.00108			35:28	1.37		A
2,3,4,6,7,8-HxCDF	0.000955			35:55	1.26		A
1,2,3,7,8,9-HxCDF	0.000998			36:39	1.23		A
1,2,3,4,6,7,8-HpCDF	0.00117			38:01	1.06		A
1,2,3,4,7,8,9-HpCDF	0.000913			39:49	1.10		A
OCDF	0.00227			43:22	0.76		A
Total TCDDs	ND	0.00122					
Total PeCDDs	0.00168						
Total HxCDDs	0.00121	B,X	0.00376				
Total HpCDDs	0.00155						
Total TCDFs	ND	0.000658	0.000510				
Total PeCDFs	0.00365	B,X					
Total HxCDFs	0.00423						
Total HpCDFs	0.00208						
WHO-2005 TEQ (ND=0)	0.00282		0.00313				
WHO-2005 TEQ (ND=½)	0.00373		0.00374				

Client Information			**Sample Information**		
Project Name:	SWMU 54		Report Basis:		
			Matrix:	Water	
Sample ID:	54MW4		Weight / Volume:	942 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14015	
Project ID:	G296-333		Instrument:	HRMS1	
Sample ID:	G296-333-3C		Filename:	a17dec06a_3-7	
Collection Date/Time:	11/30/06	16:00	Retchk:	a17dec06a_2-14	
Receipt Date/Time:	12/01/06	12:00	Begin ConCal:	a17dec06a_2-14	
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14	
Analysis Date/Time:	12/18/06	14:49	Initial Cal:	m8290-071006e	

VALUE CHANGE

Method 8290
54MW4
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.51	75.6	30:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.70	85.2	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.74	87.0	36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.53	76.6	39:12	1.05	
13C12-OCDD	4.0	2.09	52.3	43:07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.90	94.9	29:24	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.58	79.0	32:48	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.68	84.2	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.53	76.5	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.342	85.5	30:22	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.348	86.9	33:24	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.344	85.9	36:01	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.353	88.2	35:22	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.302	75.4	39:49	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:37	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:21	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	54MW4		Weight / Volume:	942 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-333		Instrument:	HRMS1
Sample ID:	G296-333-3C		Filename:	a17dec06a_3-7
Collection Date/Time:	11/30/06	16:00	Retchk:	a17dec06a_2-14
Receipt Date/Time:	12/01/06	12:00	Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	14:49	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2 07]Report

Analyzed by: HMP
Date: 21Dec06

Reviewed by:
Date: 1/4/06

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: RA
Date: 12/28/06
DV Level: II (III) IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002) X NFG Region III Draft Guidance (March 1999)

Project Name: SWMU 54
Project Number: 116560351.30007
Laboratory: Pardigm, SGS
SDG No.: G296-333
Method No.: 8290

1.0 General: Chain-of-Custody

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times

		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B". (use 10X for OCDD/OCDF data) TEQ values should not be calculated for isomers flagged B.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	✓		

Notes: MB → OCDD at 0.0117 ng/L <10x B/c in all samples
EQBLANK → EQBK-1 1,2,3,4,6,7,8-HpCDD at 0.00119 ng/L
1,2,3,7,8-PeCDF at 0.000651 J
2,3,4,7,8-PeCDF at 0.000782 J
total HpCDD- 0.00221 , total PeCDFs 0.00143

<5 times B/c in Samples

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-"; by greater than 50%, "J+/R-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "N+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits	
4	M/M+2	0.77	0.65- 0.89	
5	M+2/M+4	1.55	1.32- 1.78	
6	M+2/M+2	1.24	1.05- 1.43	
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	
~~7~~	~~M+2/M+4~~	~~1.04~~	~~0.88- 1.20~~	N/A for APPIX
~~8~~	~~M+2~~	~~0.89~~	~~0.76- 1.02~~	N/A for APPIX

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓		

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed at the same frequency as calibrations that defines descriptor switching times of scan ranges? If not, make a note in DV Report.	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≤ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

Not in this SDG.

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	✓		
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		
8.3	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	✓		

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓		
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.			✓
10.4	Is the signal to noise ≥ 2.5 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥ 2.5 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Are the two identification peak apexs within 2 seconds for positive identifications? If not, result is reported as non-detect,	✓		
10.7	Are polychlorinated diphenyl ether (PCDPE) interferences in the PCDPE channel with a S/N ratio > 2.5 and with a RT within ± 2 seconds? If yes, qualify positive furan results I.			
10.8	Was a second column confirmation used for positive 2,3,7,8-TCDF?			✓
	If no, apply "R" to the positive 2,3,7,8-TCDF results.			
	If yes, calculate the %D between the two column results, report the lower of the two values if the %D is > 25% and qualify J.			
10.9	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.10	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes:

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
11.1	Are Isotopic ratios for a detected analyte within the following established control limits...?	✓		

# Cl ion atoms	Ion Type	Theoretical	Control Limits	RIII Expanded Limits
4	M/M+2	0.77	0.65- 0.89	0.58- 0.96
5	M+2/M+4	1.55	1.32- 1.78	1.16- 1.94
6	M+2/M+2	1.24	1.05- 1.43	0.93- 1.55
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	0.38- 0.64
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	0.33- 0.55
7	M+2/M+4	1.04	0.88- 1.2	0.78- 1.30
8	M+2	0.89	0.76- 1.02	0.67- 1.11

	For positive field sample results with ion abundance ratios outside the method control limits but within the expanded RIII limits, The laboratory should report the concentration as an estimated maximum possible concentration (EMPC). Region III requires this type of result to be reported as true PCDD/PCDF isomer. The validator shall also qualify J.			
	For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.			
	For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).			
11.2	RIII separates 2,3,7,8-chlorinated isomers from total isomers for each congener group and reports results as 2,3,7,8-chlorine substituted and 'Other Total' PCDD/PCDF isomers. If laboratory did not report these separate, make a note in the DV report.	✓		

Notes:

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples: 3			
12.1.2	Number of target compounds in each analysis: 17			
12.1.3	Number of results rejected and not reported: 0			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100.1			

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00176				
1,2,3,7,8-PeCDD	ND	0.00250				
1,2,3,4,7,8-HxCDD	ND	0.00250				
1,2,3,6,7,8-HxCDD	ND	0.00250				
1,2,3,7,8,9-HxCDD	ND	0.00250				
1,2,3,4,6,7,8-HpCDD	ND	0.00267				
OCDD	0.0117			43:07	0.94	A
2,3,7,8-TCDF	ND	0.000836				
1,2,3,7,8-PeCDF	ND	0.00250				
2,3,4,7,8-PeCDF	ND	0.00250				
1,2,3,4,7,8-HxCDF	ND	0.00250				
1,2,3,6,7,8-HxCDF	ND	0.00250				
2,3,4,6,7,8-HxCDF	ND	0.00250				
1,2,3,7,8,9-HxCDF	ND	0.00250				
1,2,3,4,6,7,8-HpCDF	ND	0.00250				
1,2,3,4,7,8,9-HpCDF	ND	0.00250				
OCDF	ND	0.00580				
Total TCDDs	ND	0.00176				
Total PeCDDs	ND	0.00250				
Total HxCDDs	ND	0.00250				
Total HpCDDs	ND	0.00267				
Total TCDFs	ND	0.000836				
Total PeCDFs	ND	0.00250				
Total HxCDFs	ND	0.00250	0.00164			
Total HpCDFs	ND	0.00250				
WHO-2005 TEQ (ND=0)	0.00000351		0.00000351			
WHO-2005 TEQ (ND=½)	0.00350		0.00350			

Client Information			**Sample Information**	
Project Name:			Report Basis:	
			Matrix:	Water
Sample ID:	Lab Method Blank		Weight / Volume:	1000 mL
			Solids / Lipids:	NA %
			Original pH :	5
Laboratory Information			Batch ID:	WG14015
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a17dec06a_3-3
Collection Date/Time:			Retchk:	a17dec06a_2-14
Receipt Date/Time:			Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	11:40	Initial Cal:	m8290-071006e

SGS

Case Narrative
SGS Project: **G296-333**
Project Name: **SWMU 54**

For Methods: 8290

- The submitted samples were accepted into the lab on December 1st, 2006 and extracted on December 13th, 2006 by method 3520C. The sample extracts and associated QC extracts were then processed through clean-up by method 3630/3620 and analyzed by GC/MS for method 8290.
- The LMB associated with workgroup WG14015 has a recovery for $^{13}C_{12}$-OCDD which is below the QC limits established in the method. Data is validated based on acceptable detection limits and signal-to-noise ratios.

Craig R. Tronzo 12/22/06
Craig R. Tronzo Date
Data Validation/QA Officer

Secondary Review

W. Mike Larkins Date
Technical Director

Or Heather Patterson 22Dec06
Heather Patterson Date
Director

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP[+]
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
[+] Massachusetts Department of Environmental Protection

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00176				
1,2,3,7,8-PeCDD	ND	0.00250				
1,2,3,4,7,8-HxCDD	ND	0.00250				
1,2,3,6,7,8-HxCDD	ND	0.00250				
1,2,3,7,8,9-HxCDD	ND	0.00250				
1,2,3,4,6,7,8-HpCDD	ND	0.00267				
OCDD	0.0117			43:07	0.94	A
2,3,7,8-TCDF	ND	0.000836				
1,2,3,7,8-PeCDF	ND	0.00250				
2,3,4,7,8-PeCDF	ND	0.00250				
1,2,3,4,7,8-HxCDF	ND	0.00250				
1,2,3,6,7,8-HxCDF	ND	0.00250				
2,3,4,6,7,8-HxCDF	ND	0.00250				
1,2,3,7,8,9-HxCDF	ND	0.00250				
1,2,3,4,6,7,8-HpCDF	ND	0.00250				
1,2,3,4,7,8,9-HpCDF	ND	0.00250				
OCDF	ND	0.00580				
Total TCDDs	ND	0.00176				
Total PeCDDs	ND	0.00250				
Total HxCDDs	ND	0.00250				
Total HpCDDs	ND	0.00267				
Total TCDFs	ND	0.000836				
Total PeCDFs	ND	0.00250				
Total HxCDFs	ND	0.00250	0.00164			
Total HpCDFs	ND	0.00250				
WHO-98 TEQ (ND=0)	0.00000117		0.00000117			
WHO-98 TEQ (ND=½)	0.00377		0.00377			

Client Information			**Sample Information**	
Project Name:			Report Basis:	
			Matrix:	Water
Sample ID:	Lab Method Blank		Weight / Volume:	1000 mL
			Solids / Lipids:	NA %
			Original pH :	5
Laboratory Information			Batch ID:	WG14015
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a17dec06a_3-3
Collection Date/Time:			Retchk:	a17dec06a_2-14
Receipt Date/Time:			Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	11:40	Initial Cal:	m8290-071006e

Method 8290
Lab Method Blank

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.03	51.5	30:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.19	59.5	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.16	58.2	36:07	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.03	51.7	39:12	1.06	
13C12-OCDD	4.0	1.23	30.8 #	43:06	0.89	
13C12-2,3,7,8-TCDF	2.0	1.62	81.2	29:24	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	0.984	49.2	32:48	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.00	50.2	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	0.891	44.6	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.221	55.2	30:22	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.300	74.9	33:24	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.225	56.3	36:01	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.208	51.9	35:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.175	43.8	39:49	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:37	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:21	1.25	

Client Information			**Sample Information**	
Project Name:			Report Basis:	
			Matrix:	Water
Sample ID:	Lab Method Blank		Weight / Volume:	1000 mL
			Solids / Lipids:	NA %
			Original pH :	5
Laboratory Information			Batch ID:	WG14015
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a17dec06a_3-3
Collection Date/Time:			Retchk:	a17dec06a_2-14
Receipt Date/Time:			Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	11:40	Initial Cal:	m8290-071006e

Form Version:[8290 DB_2.07]Report

Analyzed by: UMP
Date: 20Dec06

Reviewed by: [illegible]
Date: 12/20/06

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066291

1

CLIENT: URS Corp.

CONTACT: Roshanak Aryan PHONE NO: (804) 965.9000

PROJECT: SWMU 54 SITE/PWSID#:

REPORTS TO: 5540 Falmouth St. Ste. 201 Richmond, VA 23230 E-MAIL: roshanak_aryan@urscorp.com FAX NO.: (804) 965.9764

INVOICE TO: Same as above QUOTE # P.O. NUMBER

SGS Reference: G296-333 PAGE 1 OF 1

2

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives Used: —	Analysis Required (3): 8290	REMARKS
	54MW6 ✓	11/29/06	1100	GW	2	G	X		
	EQBK-1 ✓	11/29/06	1715	GW	2	G	X		
	54MW4 ✓	11/30/06	1600	GW	2	G	X		

5

Collected/Relinquished By:(1)	Date	Time	Received By:
[signature]	11/30/06	1730	
Relinquished By: (2)	Date	Time	Received By:
	12/1/06	1200	[signature]
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

4

Shipping Carrier: Shipping Ticket No: FedEx

Samples Received Cold? (Circle) YES NO

Temperature IC: 2.5°C / _____

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

Standard T.A.T.

6

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-334 **Fraction:** Dioxin/Furan

Lab: Paradigm Analytical **Project Name** SWMU54

Reviewer: RA **Date:** March 7, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The method blank displayed a positive detection for OCDD at 0.0117 ng/L. The associated positive field sample results for OCDD were less than ten times the method blank concentration and were flagged "B,z." Equipment blank, EQBK-1 located in SDG G296-333 displayed positive detections for 1,2,3,4,6,7,8-HpCDD at 0.00119 ng/L, 1,2,3,7,8-PeCDF at 0.000651 ng/L, 2,3,4,7,8-PeCDF at 0.000782 ng/L, total HpCDDs at 0.00221 ng/L, and total PeCDFs at 0.00143 ng/L. Positive associated field sample results less than five times the equipment blank concentration were flagged "B,x."

The method blank displayed a percent recovery less than the lower control limit of 40% for the extraction standard 13C12-OCDD at 30.8%. Since the method blank is a quality control sample, no data qualifying action was necessary.

Sample 54MW7 displayed a detection reported by the laboratory as estimated maximum possible concentration (EMPC). This EMPC displayed an ion abundance ratio outside the method criterion of a theoretical ratio +/- 15% but within the EPA Region III criterion of +/- 25%, and was qualified as "J,w".

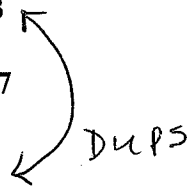
Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method with the exception of anomalies discussed above. All data are usable as qualified for their intended purpose based on the data reviewed.

Signed: R W Jan

Radford SWMU 54
G296-334

G296-334-1	**54MW3**
G296-334-2	**54MW7**
G296-334-3	**DUP-5**



Method 8290
54MW3
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00224				
1,2,3,7,8-PeCDD	ND	0.00256				
1,2,3,4,7,8-HxCDD	ND	0.00256				
1,2,3,6,7,8-HxCDD	ND	0.00256				
1,2,3,7,8,9-HxCDD	ND	0.00256				
1,2,3,4,6,7,8-HpCDD	0.00199 B3 X			39:12	1.16	A
OCDD	0.0207 B1 E			43:07	0.97	A
2,3,7,8-TCDF	ND	0.00115				
1,2,3,7,8-PeCDF	ND	0.00256				
2,3,4,7,8-PeCDF	ND	0.00256				
1,2,3,4,7,8-HxCDF	ND	0.00256				
1,2,3,6,7,8-HxCDF	ND	0.00256				
2,3,4,6,7,8-HxCDF	ND	0.00256				
1,2,3,7,8,9-HxCDF	ND	0.00256				
1,2,3,4,6,7,8-HpCDF	ND	0.00256				
1,2,3,4,7,8,9-HpCDF	ND	0.00256				
OCDF	0.00217			43:22	0.97	A
Total TCDDs	ND	0.00224				
Total PeCDDs	ND	0.00256				
Total HxCDDs	ND	0.00256				
Total HpCDDs	0.00199 B3 X		0.00391			
Total TCDFs	ND	0.00115				
Total PeCDFs	ND	0.00256				
Total HxCDFs	ND	0.00256				
Total HpCDFs	ND	0.00256				
WHO-2005 TEQ (ND=0)	0.0000268		0.0000268			
WHO-2005 TEQ (ND=½)	0.00382		0.00382			

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	54MW3		Weight / Volume:	977 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-334		Instrument:	HRMS1
Sample ID:	G296-334-1C		Filename:	a17dec06a_4-11
Collection Date/Time:	12/05/06	12:40	Retchk:	a17dec06a_3-14
Receipt Date/Time:	12/06/06	10:20	Begin ConCal:	a17dec06a_3-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_4-14
Analysis Date/Time:	12/19/06	5:06	Initial Cal:	m8290-071006e

Method 8290
54MW3
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.51	75.5	30:19	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.75	87.4	33:34	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.75	87.6	36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.55	77.6	39:12	1.04	
13C12-OCDD	4.0	2.13	53.2	43:06	0.90	
13C12-2,3,7,8-TCDF	2.0	1.90	95.0	29:24	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.63	81.4	32:48	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.72	85.8	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.53	76.6	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.341	85.3	30:21	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.370	92.5	33:24	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.349	87.3	36:01	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.357	89.1	35:21	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.314	78.5	39:48	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:36	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:21	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	54MW3		Weight / Volume:	977 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-334		Instrument:	HRMS1
Sample ID:	G296-334-1C		Filename:	a17dec06a_4-11
Collection Date/Time:	12/05/06	12:40	Retchk:	a17dec06a_3-14
Receipt Date/Time:	12/06/06	10:20	Begin ConCal:	a17dec06a_3-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_4-14
Analysis Date/Time:	12/19/06	5:06	Initial Cal:	m8290-071006e

Form Version [8290_DB_2 07]Report

Analyzed by: JWP
Date: 12-20-06

Reviewed by: MPL
Date: 12/22/06

Method 8290
54MW7
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.000945					
1,2,3,7,8-PeCDD	ND	0.00260					
1,2,3,4,7,8-HxCDD	ND	0.00260					
1,2,3,6,7,8-HxCDD	ND	0.00260					
1,2,3,7,8,9-HxCDD	ND	0.00260					
1,2,3,4,6,7,8-HpCDD	0.00106 B	J X		39:12	1.08		A
OCDD	0.0121 B	J		43:07	0.87		A
2,3,7,8-TCDF	ND	0.000557					
1,2,3,7,8-PeCDF	ND	0.00260					
2,3,4,7,8-PeCDF	EMPC	0.00260	0.000332 J	W 33:24	1.16	*	A
1,2,3,4,7,8-HxCDF	ND	0.00260					
1,2,3,6,7,8-HxCDF	ND	0.00260					
2,3,4,6,7,8-HxCDF	ND	0.00260					
1,2,3,7,8,9-HxCDF	ND	0.00260					
1,2,3,4,6,7,8-HpCDF	0.000415			38:01	1.06		A
1,2,3,4,7,8,9-HpCDF	ND	0.00260					
OCDF	0.00137			43:22	1.02		A
Total TCDDs	ND	0.000945					
Total PeCDDs	ND	0.00260					
Total HxCDDs	ND	0.00260					
Total HpCDDs	0.00212 B	J X					
Total TCDFs	ND	0.000557					
Total PeCDFs	ND	0.00260	0.000332				
Total HxCDFs	ND	0.00260					
Total HpCDFs	0.000415						
WHO-2005 TEQ (ND=0)	0.0000188		0.000118				
WHO-2005 TEQ (ND=½)	0.00317		0.00288				

Client Information			**Sample Information**		
Project Name:	SWMU 54		Report Basis:		
			Matrix:	Water	
Sample ID:	54MW7		Weight / Volume:	963 mL	
			Solids / Lipids:	NA	%
			Original pH :	8	
Laboratory Information			Batch ID:	WG14015	
Project ID:	G296-334		Instrument:	HRMS1	
Sample ID:	G296-334-2C		Filename:	a17dec06a_4-12	
Collection Date/Time:	12/05/06	11:50	Retchk:	a17dec06a_3-14	
Receipt Date/Time:	12/06/06	10:20	Begin ConCal:	a17dec06a_3-14	
Extraction Date:	12/13/06		End ConCal:	a17dec06a_4-14	
Analysis Date/Time:	12/19/06	5:53	Initial Cal:	m8290-071006e	

Method 8290
54MW7
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.66	82.9	30:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.93	96.3	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.90	95.0	36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.66	82.9	39:12	1.05	
13C12-OCDD	4.0	2.26	56.4	43:06	0.89	
13C12-2,3,7,8-TCDF	2.0	2.08	104	29:24	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.79	89.3	32:48	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.86	93.1	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.66	83.1	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.350	87.4	30:21	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.381	95.3	33:24	1.57	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.355	88.6	36:01	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.365	91.3	35:21	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.309	77.3	39:48	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:36	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:19	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	54MW7		Weight / Volume:	963 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-334		Instrument:	HRMS1
Sample ID:	G296-334-2C		Filename:	a17dec06a_4-12
Collection Date/Time:	12/05/06	11:50	Retchk:	a17dec06a_3-14
Receipt Date/Time:	12/06/06	10:20	Begin ConCal:	a17dec06a_3-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_4-14
Analysis Date/Time:	12/19/06	5:53	Initial Cal:	m8290-071006e

Form Version [8290_DB_2 07]Report

Analyzed by: JMP
Date: 12-28-06

Reviewed by: MEI
Date: 12/28/06

Method 8290
Dup-5
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00203				
1,2,3,7,8-PeCDD	ND	0.00258				
1,2,3,4,7,8-HxCDD	ND	0.00258				
1,2,3,6,7,8-HxCDD	ND	0.00258				
1,2,3,7,8,9-HxCDD	ND	0.00258				
1,2,3,4,6,7,8-HpCDD	ND	0.00285				
OCDD	0.0117 B, E			43:07	0.88	A
2,3,7,8-TCDF	ND	0.00121				
1,2,3,7,8-PeCDF	ND	0.00258				
2,3,4,7,8-PeCDF	ND	0.00258				
1,2,3,4,7,8-HxCDF	ND	0.00258				
1,2,3,6,7,8-HxCDF	ND	0.00258				
2,3,4,6,7,8-HxCDF	ND	0.00258				
1,2,3,7,8,9-HxCDF	ND	0.00258				
1,2,3,4,6,7,8-HpCDF	ND	0.00258				
1,2,3,4,7,8,9-HpCDF	ND	0.00258				
OCDF	ND	0.00587				
Total TCDDs	ND	0.00203				
Total PeCDDs	ND	0.00258				
Total HxCDDs	ND	0.00258				
Total HpCDDs	ND	0.00285				
Total TCDFs	ND	0.00121				
Total PeCDFs	ND	0.00258				
Total HxCDFs	ND	0.00258				
Total HpCDFs	ND	0.00258				
WHO-2005 TEQ (ND=0)	0.00000351		0.00000351			
WHO-2005 TEQ (ND=½)	0.00374		0.00374			

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	Dup-5		Weight / Volume:	969 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-334		Instrument:	HRMS1
Sample ID:	G296-334-3C		Filename:	a17dec06a_4-13
Collection Date/Time:	12/05/06		Retchk:	a17dec06a_3-14
Receipt Date/Time:	12/06/06	10:20	Begin ConCal:	a17dec06a_3-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_4-14
Analysis Date/Time:	12/19/06	6:41	Initial Cal:	m8290-071006e

Method 8290
Dup-5
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.37	68.7	30:19	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.63	81.6	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.70	85.0	36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.47	73.3	39:12	1.05	
13C12-OCDD	4.0	2.00	50.0	43:06	0.90	
13C12-2,3,7,8-TCDF	2.0	1.73	86.3	29:24	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.54	77.0	32:48	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.71	85.5	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.47	73.3	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.301	75.2	30:21	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.335	83.8	33:24	1.57	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.333	83.3	36:01	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.314	78.4	35:21	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.286	71.5	39:48	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:36	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:19	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	Dup-5		Weight / Volume:	969 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-334		Instrument:	HRMS1
Sample ID:	G296-334-3C		Filename:	a17dec06a_4-13
Collection Date/Time:	12/05/06		Retchk:	a17dec06a_3-14
Receipt Date/Time:	12/06/06	10:20	Begin ConCal:	a17dec06a_3-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_4-14
Analysis Date/Time:	12/19/06	6:41	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.07]Report

Analyzed by: _____
Date: 12-28-06

Reviewed by: _____
Date: 1/22/07

DATA VALIDATION WORKSHEET
Dioxins and Furans Analysis

Reviewer: RA
Date: 1/3/07
DV Level: II (III) IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002) X NFG Region III Draft Guidance (March 1999)

Project Name: SWMU 54
Project Number: 116560351
Laboratory: SGS
SDG No.: G2960-334
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B". (use 10X for OCDD/OCDF data) TEQ values should not be calculated for isomers flagged B.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	✓		

Notes: MB → OCDD at 0.0117 ng/L <10X → B, Z
EqBlank from SDG G2960-333, EQBK-1 → 1,2,3,4,6,7,8-HpCDD 0.00119 ng/L <5X → B, X
1,2,3,7,8-PeCDF 0.000651 J
2,3,4,7,8-PeCDF 0.000782
Total HpCDDs 0.00221 ng/L
Total PeCDFs 0.00143 ng/L

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-"; by greater than 50%, "J+/R-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "N+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits	
4	M/M+2	0.77	0.65- 0.89	
5	M+2/M+4	1.55	1.32- 1.78	
6	M+2/M+2	1.24	1.05- 1.43	
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	
~~7~~	~~M+2/M+4~~	~~1.04~~	~~0.88- 1.20~~	N/A for APPIX
~~8~~	~~M+2~~	~~0.89~~	~~0.76- 1.02~~	N/A for APPIX

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓		

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed at the same frequency as calibrations that defines descriptor switching times of scan ranges? If not, make a note in DV Report.	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≤ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".		✓	

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

Not in this SDG.

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards

		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	✓		
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		
8.3	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	✓		

Notes: The MB %R<40% for 13C12-OCDD at 30.8%. This is a QC sample, No action ✓

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.	✓		
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes: 54MW3 ng/L and DUP-5 EDL
OCDF 0.00217 ND 0.00587 CCV

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓		
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.	✓		
10.4	Is the signal to noise ≥ 2.5 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥ 2.5 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Are the two identification peak apexs within 2 seconds for positive identifications? If not, result is reported as non-detect,			
10.7	Are polychlorinated diphenyl ether (PCDPE) interferences in the PCDPE channel with a S/N ratio > 2.5 and with a RT within ± 2 seconds? If yes, qualify positive furan results I.	✓		
10.8	Was a second column confirmation used for positive 2,3,7,8-TCDF?			✓
	If no, apply "R" to the positive 2,3,7,8-TCDF results.			
	If yes, calculate the %D between the two column results, report the lower of the two values if the %D is > 25% and qualify J.			
10.9	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.10	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes:

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
11.1	Are Isotopic ratios for a detected analyte within the following established control limits...?	✓		

# Cl ion atoms	Ion Type	Theoretical	Control Limits	RIII Expanded Limits
4	M/M+2	0.77	0.65- 0.89	0.58- 0.96
5	M+2/M+4	1.55	1.32- 1.78	1.16- 1.94
6	M+2/M+2	1.24	1.05- 1.43	0.93- 1.55
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	0.38- 0.64
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	0.33- 0.55
7	M+2/M+4	1.04	0.88- 1.2	0.78- 1.30
8	M+2	0.89	0.76- 1.02	0.67- 1.11

For positive field sample results with ion abundance ratios outside the method control limits but within the expanded RIII limits, The laboratory should report the concentration as an estimated maximum possible concentration (EMPC). Region III requires this type of result to be reported as true PCDD/PCDF isomer. The validator shall also qualify J.

For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.

For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).

11.2	RIII separates 2,3,7,8-chlorinated isomers from total isomers for each congener group and reports results as 2,3,7,8-chlorine substituted and 'Other Total' PCDD/PCDF isomers. If laboratory did not report these separate, make a note in the DV report.	✓		

Notes:

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00176				
1,2,3,7,8-PeCDD	ND	0.00250				
1,2,3,4,7,8-HxCDD	ND	0.00250				
1,2,3,6,7,8-HxCDD	ND	0.00250				
1,2,3,7,8,9-HxCDD	ND	0.00250				
1,2,3,4,6,7,8-HpCDD	ND	0.00267				
OCDD	0.0117			43:07	0.94	A
2,3,7,8-TCDF	ND	0.000836				
1,2,3,7,8-PeCDF	ND	0.00250				
2,3,4,7,8-PeCDF	ND	0.00250				
1,2,3,4,7,8-HxCDF	ND	0.00250				
1,2,3,6,7,8-HxCDF	ND	0.00250				
2,3,4,6,7,8-HxCDF	ND	0.00250				
1,2,3,7,8,9-HxCDF	ND	0.00250				
1,2,3,4,6,7,8-HpCDF	ND	0.00250				
1,2,3,4,7,8,9-HpCDF	ND	0.00250				
OCDF	ND	0.00580				
Total TCDDs	ND	0.00176				
Total PeCDDs	ND	0.00250				
Total HxCDDs	ND	0.00250				
Total HpCDDs	ND	0.00267				
Total TCDFs	ND	0.000836				
Total PeCDFs	ND	0.00250				
Total HxCDFs	ND	0.00250	0.00164			
Total HpCDFs	ND	0.00250				
WHO-98 TEQ (ND=0)	0.00000117		0.00000117			
WHO-98 TEQ (ND=½)	0.00377		0.00377			

Client Information			**Sample Information**	
Project Name:			Report Basis:	
			Matrix:	Water
Sample ID:	Lab Method Blank		Weight / Volume:	1000 mL
			Solids / Lipids:	NA %
			Original pH :	5
Laboratory Information			Batch ID:	WG14015
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a17dec06a_3-3
Collection Date/Time:			Retchk:	a17dec06a_2-14
Receipt Date/Time:			Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	11:40	Initial Cal:	m8290-071006e

Method 8290
Lab Method Blank

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.03	51.5	30:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.19	59.5	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.16	58.2	36:07	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.03	51.7	39:12	1.06	
13C12-OCDD	4.0	1.23	30.8 #	43:06	0.89	
13C12-2,3,7,8-TCDF	2.0	1.62	81.2	29:24	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	0.984	49.2	32:48	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.00	50.2	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	0.891	44.6	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.221	55.2	30:22	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.300	74.9	33:24	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.225	56.3	36:01	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.208	51.9	35:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.175	43.8	39:49	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:37	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:21	1.25	

Client Information			**Sample Information**	
Project Name:			Report Basis:	
			Matrix:	Water
Sample ID:	Lab Method Blank		Weight / Volume:	1000 mL
			Solids / Lipids:	NA %
			Original pH :	5
Laboratory Information			Batch ID:	WG14015
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a17dec06a_3-3
Collection Date/Time:			Retchk:	a17dec06a_2-14
Receipt Date/Time:			Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	11:40	Initial Cal:	m8290-071006e

Form Version:[8290 DB_2.07]Report

Analyzed by: UMP
Date: 20Dec06

Reviewed by: MD
Date: 12/20/06

Method 8290
EQBK-1
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00112				
1,2,3,7,8-PeCDD	ND	0.00271				
1,2,3,4,7,8-HxCDD	ND	0.00271				
1,2,3,6,7,8-HxCDD	ND	0.00271				
1,2,3,7,8,9-HxCDD	ND	0.00271				
1,2,3,4,6,7,8-HpCDD	0.00119			39:13	1.11	A
OCDD	0.00782	B,Z		43:07	0.82	A
2,3,7,8-TCDF	ND	0.000608				
1,2,3,7,8-PeCDF	0.000651			32:48	1.66	A
2,3,4,7,8-PeCDF	0.000782			33:24	1.58	A
1,2,3,4,7,8-HxCDF	ND	0.00271				
1,2,3,6,7,8-HxCDF	ND	0.00271				
2,3,4,6,7,8-HxCDF	ND	0.00271				
1,2,3,7,8,9-HxCDF	ND	0.00271				
1,2,3,4,6,7,8-HpCDF	ND	0.00271				
1,2,3,4,7,8,9-HpCDF	ND	0.00271				
OCDF	ND	0.00543				
Total TCDDs	ND	0.00112				
Total PeCDDs	ND	0.00271				
Total HxCDDs	ND	0.00271				
Total HpCDDs	0.00221					
Total TCDFs	ND	0.000608				
Total PeCDFs	0.00143					
Total HxCDFs	ND	0.00271				
Total HpCDFs	ND	0.00271				
WHO-98 TEQ (ND=0)	0.000436		0.000436			
WHO-98 TEQ (ND=½)	0.00336		0.00336			

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	EQBK-1		Weight / Volume:	921 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-333		Instrument:	HRMS1
Sample ID:	G296-333-2C		Filename:	a17dec06a_3-6
Collection Date/Time:	11/29/06	17:15	Retchk:	a17dec06a_2-14
Receipt Date/Time:	12/01/06	12:00	Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	14:02	Initial Cal:	m8290-071006e

Method 8290
EQBK-1
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.57	78.3	30:19	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.73	86.4	33:34	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.81	90.3	36:07	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.57	78.4	39:12	1.05	
13C12-OCDD	4.0	2.30	57.4	43:06	0.89	
13C12-2,3,7,8-TCDF	2.0	1.98	99.2	29:24	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.61	80.4	32:48	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.77	88.6	35:27	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.58	79.0	38:01	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.341	85.4	30:22	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.350	87.5	33:24	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.361	90.3	36:01	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.334	83.5	35:22	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.301	75.2	39:49	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:37	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:21	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54		Report Basis:	
			Matrix:	Water
Sample ID:	EQBK-1		Weight / Volume:	921 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14015
Project ID:	G296-333		Instrument:	HRMS1
Sample ID:	G296-333-2C		Filename:	a17dec06a_3-6
Collection Date/Time:	11/29/06	17:15	Retchk:	a17dec06a_2-14
Receipt Date/Time:	12/01/06	12:00	Begin ConCal:	a17dec06a_2-14
Extraction Date:	12/13/06		End ConCal:	a17dec06a_3-14
Analysis Date/Time:	12/18/06	14:02	Initial Cal:	m8290-071006e

Form Version [8290_DB_2 07]Report

Analyzed by: HMP
Date: 21Dec06

Reviewed by: MPL
Date: 12/21/06

SGS

Case Narrative
SGS Project: **G396-334**
Project Name: **SWMU 54**

For Methods: 8290

- The submitted samples were accepted into the lab on December 6th, 2006 and extracted on December 13th, 2006 by method 3520C. The sample extracts and associated QC extracts were then processed through clean-up by method 3630/3620 and analyzed by HRGC/HRMS for method 8290.
- The LMB associated with workgroup WG14015 has a recovery for $^{13}C_{12}$-OCDD which is below the method QC limits.

Craig R. Tronzo 12/28/06

Craig R. Tronzo Date
Data Validation/QA Officer

Secondary Review

W. Mike Larkins Date
Technical Director

Or

for HMP 12/28/06

Heather Patterson Date
Director

SGS

List of Qualifiers

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* See case narrative

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation generally results in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

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066292

(1)

CLIENT: URS Corp

CONTACT: Roshanak Aryan PHONE NO: (804) 965-9000

PROJECT: SWMU 54 ✓ SITE/PWSID#:

REPORTS TO: 5540 Falmouth St. Suite 201, Richmond, VA 23230 E-MAIL: roshanak_aryan@urscorp.com FAX NO.: (804) 965-9704

INVOICE TO: Same as above QUOTE #

P.O. NUMBER

SGS Reference: G296-334

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives Used	Analysis Required (3) 8240	REMARKS
	54MW3 ✓	12/5/06	1240	GW	2	G	—	X	
	54MW7 ✓	12/5/06	1150	GW	2	G	—	X	
	DUP-5 ✓	12/5/06	—	GW	2	G	—	X	

(5)

	Date	Time	Received By:
Collected/Relinquished By:(1)	12/5/06	1430	
Relinquished By: (2)	12/6/06	1020	
Relinquished By: (3)			
Relinquished By: (4)			

(4)

Shipping Carrier: Fed Ex

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 1.8°C

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

Standard T.A.T.

200 W. Potter Drive Anchorage, AK 99518 Tel. (907) 562-2343 Fax: (907) 561-5301
5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
1270 Greenbrier Street Charleston, WV 25311 Tel (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

SGS

Case Narrative
SGS Project: **G396-334**
Project Name: **SWMU 54**

For Methods: 8290

- The submitted samples were accepted into the lab on December 6th, 2006 and extracted on December 13th, 2006 by method 3520C. The sample extracts and associated QC extracts were then processed through clean-up by method 3630/3620 and analyzed by HRGC/HRMS for method 8290.
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Craig R. Tronzo Date
Data Validation/QA Officer

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W. Mike Larkins Date
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for HMP 12/28/06
Heather Patterson Date
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SGS

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EMPC	"Estimated Maximum Possible Concentration"
ppt	Parts-per-trillion (pg/g; ng/L)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.
#	Outside quality control limits
*	See case narrative

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DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

SGS

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1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-346 **Fraction:** PCB Congeners & Dioxin/Furans

Lab: Paradigm Analytical **Project Name** Radford SWMU 54

Reviewer: RA **Date:** March 8, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: For the PCB-Congeners analyses, the method blank displayed positive detections for several congeners. The associated field sample results were greater than five times the method blank concentrations and no data qualifying action was necessary.

Sample 54SB46A displayed a percent recovery (%R) less than the lower control limit of 25% for the extraction standard 13C-4-DiCB at 23.3%. The associated field sample result, 8-DiCB was positive and was flagged "J,i". This sample also displayed a %R less than the lower control limit of 30% for the cleanup standard 13C-178-HpCB at 26.6%. No data qualifying action was necessary since this is a cleanup standard and no compounds are quantified from it.

For sample 54SB46A, several extraction standards displayed signal to noise ratios less than 10 as follows: 13C-19-TrCB at 6%, 13C-37-TrCB at 6%, 13C-189-HpCB at 7%, 13C-205-OcCB at 5%, 13C-208-NoCB at 4%, and 13C-206-NoCB at 4%. The associated field sample results were positive and were flagged "J,n".

Several compounds exceeded the calibration range of the instrument in both samples and were flagged "E" by the laboratory. These results were flagged "J,q" by the reviewer, unless previously flagged for other anomalies.

Sample 54SB46C displayed detections for two congeners that were flagged "K" by the laboratory. It was confirmed by the laboratory that these were estimated maximum possible concentrations (EMPCs). The ion abundance ratio was within the EPA Region III criterion of +/- 25% for congener 81 and this result was flagged "J,w". The ion abundance ratio was outside the EPA Region III criterion of +/- 25% for congener 169 and this result was changed to a non-detect.

For the dioxin-furans analyses, the method blanks displayed positive detections for several compounds. Positive associated field sample results less than ten times the method blank concentrations for OCDD and OCDF and less than five times the method blank concentrations for the other compounds were flagged "B,z".

Sample 54SB40A displayed a %R less than the lower control limit of 40% for the extraction standard 13C12-OCDD at 39.7%. The associated field sample results were positive and were flagged "J,i".

The field duplicate pair 54SB42A/DUP-1 displayed results for 2,3,7,8-TCDF with a relative percent difference greater than the control limit of 50% at 149%. These results were flagged "J,f" for these samples.

Several compounds exceeded the calibration range of the instrument in several samples and were flagged "E" by the laboratory. These results were flagged "J,q" by the reviewer, unless previously flagged for other anomalies.

Several samples displayed detections reported by the laboratory as EMPCs. In cases where the EMPC displayed an ion abundance ratio outside the method criterion of a theoretical ratio +/- 15% but within the EPA Region III criterion of +/- 25%, the EMPC was qualified as "J,w". In cases where the EMPC displayed an ion abundance ratio greater than the EPA Region III criterion of +/- 25%, the EMPC was changed to a non-detect.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed. Please note that detection limits were raised in several samples due to dilutions.

Signed: Ranjan

Paradigm Analytical Laboratories

Cust Proj ID: TWNU54
Client Name: URS

G296-346

Due Date: 2007-01-31 17:00:00
Login Date: 2007-01-11 08:24:46

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G296-346-1	A	54SB46A	STD	2007-01-09 10:30:00	2007-01-10	2007-01-31	Soil	W2	Full	1668A	LG::REVW
						2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-2	A	54SB46C	STD	2007-01-09 10:45:00	2007-01-10	2007-01-31	Soil	W2	Full	1668A	LG::REVW
						2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-3	A	54SB54C	STD	2007-01-09 10:05:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-4	A	54SB45B	STD	2007-01-09 09:18:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-5	A	54SB54A	STD	2007-01-09 09:45:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-6	A	54SB45A	STD	2007-01-09 09:14:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-7	A	54SB54B	STD	2007-01-09 09:55:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-8	A	54SB45C	STD	2007-01-09 09:23:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-9	A	54SB41C	STD	2007-01-09 09:00:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-10	A	54SB41B	STD	2007-01-09 08:55:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-11	A	54SB42B	STD	2007-01-08 16:15:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-12	A	54SB42C	STD	2007-01-08 16:25:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-13	A	Dup-1	STD	2007-01-08 00:00:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-14	A	Dup-4	STD	2007-01-09 00:00:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-15	A	54SB77B	STD	2007-01-09 15:20:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-16	A	54SB77C	STD	2007-01-09 15:30:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-17	A	54SB77C MS	STD	2007-01-09 15:30:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-18	A	54SB77C MSD	STD	2007-01-09 15:30:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-19	A	54SB53A	STD	2007-01-09 10:50:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-20	A	54SB77A	STD	2007-01-09 15:10:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-21	A	Dup-2	STD	2007-01-09 00:00:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-22	A	54SB43A	STD	2007-01-08 14:46:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-23	A	54SB43B	STD	2007-01-08 14:50:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-24	A	54SB43C	STD	2007-01-08 14:55:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-25	A	54SB40A	STD	2007-01-08 15:15:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-26	A	54SB40B	STD	2007-01-08 15:25:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-27	A	54SB40C	STD	2007-01-08 15:30:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-28	A	54SB39A	STD	2007-01-08 15:35:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-29	A	54SB39B	STD	2007-01-08 15:40:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-30	A	54SB39C	STD	2007-01-08 15:45:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-346-31	A	54SB42A	STD	2007-01-08 16:00:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW

DUPS

DUP-2 and 54SB54B
DUP-1 and 54SB42A
DUP-4 and 54SB77C

6

01/11/2007

Radford SWMU 54
Duplicate Statistics
54SB42A and DUP-1

DIOXIN/FURANS	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
1,2,3,4,7,8-HxCDD	pg/g	5	25.0	0	0.606	200.0%	0.606	20.0	P
1,2,3,6,7,8-HxCDD	pg/g	5	25.0	1.7	1.77	4.0%	0.07	20.0	P
1,2,3,7,8,9-HxCDD	pg/g	5	25.0	0	1.45	200.0%	1.45	20.0	P
1,2,3,4,6,7,8-HpCDD	pg/g	5	25.0	60.7	73.2	18.7%	12.5	20.0	P
OCDD	pg/g	10	50.0	3630	3890	6.9%	260	40.0	P
2,3,7,8-TCDF	pg/g	1	5.0	5.91	0.863	**149.0%**	5.047	4.0	**F**
1,2,3,7,8-PeCDF	pg/g	5	25.0	0	0.489	200.0%	0.489	20.0	P
2,3,4,7,8-PeCDF	pg/g	5	25.0	1.64	1.25	27.0%	0.39	20.0	P
1,2,3,4,7,8-HxCDF	pg/g	5	25.0	1.96	1.82	7.4%	0.14	20.0	P
1,2,3,6,7,8-HxCDF	pg/g	5	25.0	1.12	1.33	17.1%	0.21	20.0	P
2,3,4,6,7,8-HxCDF	pg/g	5	25.0	0.00	1.87	200.0%	1.87	20.0	P
1,2,3,7,8,9-HxCDF	pg/g	5	25.0	0.00	0.491	200.0%	0.491	20.0	P
1,2,3,4,6,7,8-HpCDF	pg/g	5	25.0	9.46	12.2	25.3%	2.74	20.0	P
1,2,3,4,7,8,9-HpCDF	pg/g	5	25.0	0	0.908	200.0%	0.908	20.0	P
OCDF	pg/g	10	50.0	20.5	26.4	25.2%	5.9	40.0	P

Control limit

[sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

54SB54B and DUP-2

DIOXIN/FURANS	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
1,2,3,4,6,7,8-HpCDD	pg/g	5	25.0	2.15	2.06	4.3%	0.09	20.0	P
OCDD	pg/g	10	50.0	67.1	65.7	2.1%	1.4	40.0	P

Radford SWMU 54
Duplicate Statistics

54SB77C and DUP-4

DIOXIN/FURANS	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
1,2,3,4,6,7,8-HpCDD	pg/g	5	25.0	1.06	1.3	20.3%	0.24	20.0	P
OCDD	pg/g	10	50.0	29.8	40.2	29.7%	10.4	40.0	P

Control limit

[sample]>5xRL use 50%

[sample]<5xRL use Delta < 4xRL

Results for Selected PCB Congeners by Method 1668A

Client Project ID:
TWNU54

Client Sample ID
54SB46A

Laboratory Information			**Sample Information**		
Lab Project ID:	G296-346		Matrix:	Soil	
Lab Sample ID:	G296-346-1D		Amount:	15.2	g
Dilution factor:	10		pH:	NA	
Collection Date/Time:	09-Jan-07	10:30	Solids/Basis:	80.8	/ Dry
Receipt Date/Time:	10-Jan-07	09:50	QC Batch ID:	WG14070/14057	
Extraction Date:	16-Jan-07		Filename:	b20jan07a-4	
Analysis Date/Time:	20-Jan-07	17:51	ConCal:	b20jan07a-1	
			RRT Std:	b20jan07a-2	
			Initial Cal:	m1668a-b010906d	

Analyte (Congener#)	Amount (pg/g)	EDL (pg/g)	RL (pg/g)	RT #	Ratio #	Qualifier
8-DiCB	353 J,i	13.0	8.13	10:30	1.65	
18,30-TrCB	2160 J,n	13.0	16.3	12:13	1.08	
31-TrCB	2540	10.1	8.13	15:28	1.05	
20,28-TrCB	2120	9.72	16.3	15:46	1.05	
37-TrCB	1090 J,n	182	8.13	20:01	1.03	
52-TeCB	137000 J,g	16.0	8.13	17:35	0.79	E
49,69-TeCB	25300 g	13.2	16.3	18:05	0.79	
44,47,65-TeCB	49100 J,g	14.4	24.4	18:38	0.80	E
61,70,74,76-TeCB	73300 J,g	42.0	32.5	23:00	0.79	E
66-TeCB	21400 g	41.9	8.13	23:24	0.80	
56-TeCB	8190	42.6	8.13	24:15	0.78	
60-TeCB	2890	41.9	8.13	24:31	0.79	
81-TeCB	ND	47.4	8.13			U
77-TeCB	2750	42.0	8.13	29:09	0.77	
95-PeCB	180000 J,g	24.0	8.13	21:57	1.58	E
90,101,113-PeCB	221000	21.7	24.4	25:33	1.59	E
99-PeCB	89200	19.4	8.13	26:17	1.58	E
86,87,97,108,119,125-PeCB	165000 J,g	21.2	48.8	27:04	1.58	E
123-PeCB	2350	67.6	8.13	31:52	1.61	
118-PeCB	123000 J,g	71.9	8.13	32:19	1.58	E
114-PeCB	3170	79.8	8.13	33:04	1.52	
105-PeCB	67100 J,g	80.8	8.13	34:01	1.61	E
126-PeCB	612	87.1	8.13	38:33	1.41	
135,151-HxCB	76100 J,g	83.1	16.3	29:25	1.31	E
132-HxCB	107000 J,g	219	8.13	32:26	1.28	E
146-HxCB	32300 g	176	8.13	34:04	1.29	
153,168-HxCB	222000 J,g	173	16.3	34:58	1.27	E
129,138,163-HxCB	318000 J,g	197	24.4	36:49	1.29	E
158-HxCB	26400	136	8.13	37:23	1.26	
128,166-HxCB	50300 J,g	172	16.3	38:42	1.29	E
167-HxCB	11900	51.9	8.13	41:22	1.28	
156,157-HxCB	37000 J,g	74.5	16.3	43:06	1.28	E
169-HxCB	ND	61.0	8.13			U
187-HpCB	29600 J,n	41.9	8.13	38:48	1.09	
183,185-HpCB	21000	52.6	16.3	39:42	1.02	
177-HpCB	19500	60.6	8.13	40:45	1.05	
180,193-HpCB	79100	49.1	16.3	45:14	1.06	E
170-HpCB	45900	63.2	8.13	47:12	1.05	E
189-HpCB	1660 J,n	23.2	8.13	52:09	1.10	

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Results for Selected PCB Congeners by Method 1668A

Client Project ID:
TWNU54

Client Sample ID
54SB46A

Analyte (Congener#)	Amount (pg/g)	EDL (pg/g)	RL (pg/g)	RT #	Ratio #	Qualifier
201-OcCB	1830 J, n	20.0	8.13	42:18	0.95	
196-OcCB	9560	27.9	8.13	49:18	0.97	
203-OcCB	9330	23.5	8.13	49:37	0.90	
195-OcCB	8080	37.2	8.13	51:42	0.91	
194-OcCB	19300	36.1	8.13	55:28	0.90	
206-NoCB	4160 J, n	20.7	8.13	58:59	0.81	
209-DeCB	9050	17.8	8.13	61:30	1.19	

Recovery Information

Labeled Standard	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards			(25-150%)			
13C-4-DiCB	2.00	0.466	23.3 #	8:27	1.42	
13C-15-DiCB	2.00	0.639	31.9	13:01	1.70	
13C-19-TrCB	2.00	0.939	47.0	10:44	0.84 #	
13C-37-TrCB	2.00	0.876	43.8	19:59	1.01	
13C-54-TeCB	2.00	0.683	34.2	13:15	1.10 #	
13C-81-TeCB	2.00	0.738	36.9	28:20	0.85	
13C-77-TeCB	2.00	0.686	34.3	29:07	0.73	
13C-104-PeCB	2.00	0.868	43.4	18:33	1.55	
13C-123-PeCB	2.00	0.750	37.5	31:48	1.37	
13C-118-PeCB	2.00	0.842	42.1	32:18	1.53	
13C-114-PeCB	2.00	0.635	31.7	33:01	1.46	
13C-105-PeCB	2.00	0.662	33.1	33:58	1.61	
13C-126-PeCB	2.00	0.602	30.1	38:36	1.81 #	
13C-155-HxCB	2.00	0.811	40.6	25:10	1.33	
13C-167-HxCB	2.00	0.608	30.4	41:20	1.39	
13C-156,157-HxCB	4.00	1.19	29.8	43:06	1.30	
13C-169-HxCB	2.00	0.583	29.1	48:14	1.43 #	
13C-188-HpCB	2.00	1.10	55.1	32:55	1.02	
13C-189-HpCB	2.00	1.24	62.0	52:06	1.22 #	
13C-202-OcCB	2.00	0.727	36.3	40:50	0.93	
13C-205-OcCB	2.00	0.943	47.2	56:12	1.31 #	
13C-208-NoCB	2.00	1.17	58.7	51:14	0.70	
13C-206-NoCB	2.00	0.933	46.6	58:56	1.12 #	
13C-209-DeCB	2.00	0.823	41.2	61:29	1.01	
Cleanup Standards			(30-135%)			
13C-28-TrCB	2.00	1.08	53.8	15:44	0.95	
13C-111-PeCB	2.00	0.765	38.3	29:05	1.82 #	
13C-178-HpCB	2.00	0.532	26.6 #	37:24	0.91	
Injection Standards						
13C-9-DiCB	2.00			9:50	1.66	
13C-52-TeCB	2.00			17:34	0.81	
13C-101-PeCB	2.00			25:32	1.36	
13C-138-HxCB	2.00			36:47	1.24	
13C-194-OcCB	2.00			55:27	0.86	

Analyzed By: AF
Date: 02/09/07

Reviewed By:
Date: 2/9/06

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Results for Selected PCB Congeners by Method 1668A

Client Project ID:
TWNU54

Client Sample ID
54SB46C

Laboratory Information			**Sample Information**		
Lab Project ID:	G296-346		Matrix:	Soil	
Lab Sample ID:	G296-346-2D		Amount:	14.9	g
Dilution factor:	10		pH:	NA	
Collection Date/Time:	09-Jan-07	10:45	Solids/Basis:	80.6	/ Dry
Receipt Date/Time:	10-Jan-07	09:50	QC Batch ID:	WG14070/14057	
Extraction Date:	16-Jan-07		Filename:	b20jan07a-5	
Analysis Date/Time:	20-Jan-07	18:57	ConCal:	b20jan07a-1	
			RRT Std:	b20jan07a-2	
			Initial Cal:	m1668a-b010906d	

Analyte (Congener#)	Amount (pg/g)	EDL (pg/g)	RL (pg/g)	RT #	Ratio #	Qualifier
8-DiCB	215	10.5	8.32	10:31	1.61	
18,30-TrCB	2550	9.07	16.6	12:14	1.05	
31-TrCB	3280	7.02	8.32	15:30	1.06	
20,28-TrCB	3300	6.76	16.6	15:47	1.06	
37-TrCB	1190	10.6	8.32	20:02	0.92	
52-TeCB	114000J, g	11.9	8.32	17:37	0.79	E
49,69-TeCB	22100	9.80	16.6	18:08	0.81	
44,47,65-TeCB	43100J, g	10.7	25.0	18:41	0.80	E
61,70,74,76-TeCB	84900J, g	27.4	33.3	23:01	0.79	E
66-TeCB	22700	27.3	8.32	23:25	0.80	
56-TeCB	8040	27.7	8.32	24:16	0.79	
60-TeCB	4130	27.3	8.32	24:32	0.76	
81-TeCB	171 J, W	26.5	8.32	28:21	0.63 #	K
77-TeCB	2510	30.0	8.32	29:09	0.78	
95-PeCB	155000 J, g	16.2	8.32	21:58	1.59	E
90,101,113-PeCB	212000	14.6	25.0	25:35	1.59	E
99-PeCB	84800	13.1	8.32	26:18	1.59	E
86,87,97,108,119,125-PeCB	113000J, g	14.3	49.9	27:07	1.58	E
123-PeCB	2880	48.3	8.32	31:51	1.55	
118-PeCB	140000J, g	43.8	8.32	32:19	1.59	E
114-PeCB	4560	49.7	8.32	33:03	1.57	
105-PeCB	76100 J, g	64.1	8.32	34:01	1.59	E
126-PeCB	655	58.7	8.32	38:32	1.66	
135,151-HxCB	57400J, g	32.6	16.6	29:26	1.32	E
132-HxCB	82500J, g	173	8.32	32:26	1.28	E
146-HxCB	23000	139	8.32	34:04	1.29	
153,168-HxCB	164000J, g	137	16.6	34:56	1.29	E
129,138,163-HxCB	254000J, g	156	25.0	36:47	1.28	E
158-HxCB	24400	107	8.32	37:22	1.26	
128,166-HxCB	42900J, g	136	16.6	38:41	1.28	E
167-HxCB	9150	46.8	8.32	41:20	1.26	
156,157-HxCB	31200	55.7	16.6	43:05	1.26	
169-HxCB ND	~~164~~	45.0	8.32	48:17	2.18 #	K U
187-HpCB	29700	29.5	8.32	38:47	1.07	
183,185-HpCB	21000	54.1	16.6	39:42	1.06	
177-HpCB	15700	62.4	8.32	40:44	1.06	
180,193-HpCB	62400J, g	50.5	16.6	45:13	1.05	E
170-HpCB	36200J, g	65.0	8.32	47:11	1.06	E
189-HpCB	1350	21.0	8.32	52:08	1.06	

VALUE CHANGE

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Results for Selected PCB Congeners by Method 1668A

Client Project ID:
TWNU54

Client Sample ID
54SB46C

Analyte (Congener#)	Amount (pg/g)	EDL (pg/g)	RL (pg/g)	RT #	Ratio #	Qualifier
201-OcCB	1840	45.9	8.32	42:17	0.90	
196-OcCB	8130	64.1	8.32	49:17	0.97	
203-OcCB	8840	54.0	8.32	49:36	0.88	
195-OcCB	5350	33.5	8.32	51:41	0.93	
194-OcCB	14200	32.5	8.32	55:28	0.90	
206-NoCB	6390	29.0	8.32	58:59	0.83	
209-DeCB	2210	24.4	8.32	61:30	1.26	

Recovery Information

Labeled Standard	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards			(25-150%)			
13C-4-DiCB	2.00	0.681	34.0	8:28	1.60	
13C-15-DiCB	2.00	1.18	58.8	13:03	1.44	
13C-19-TrCB	2.00	1.04	51.8	10:44	1.04	
13C-37-TrCB	2.00	1.05	52.3	20:01	1.07	
13C-54-TeCB	2.00	0.859	42.9	13:17	0.76	
13C-81-TeCB	2.00	0.903	45.2	28:21	0.82	
13C-77-TeCB	2.00	0.823	41.2	29:07	0.68	
13C-104-PeCB	2.00	1.04	51.8	18:34	1.89 #	
13C-123-PeCB	2.00	0.942	47.1	31:48	1.70	
13C-118-PeCB	2.00	1.15	57.3	32:18	1.46	
13C-114-PeCB	2.00	0.881	44.0	33:01	1.75	
13C-105-PeCB	2.00	0.913	45.7	33:59	1.40	
13C-126-PeCB	2.00	0.698	34.9	38:33	1.66	
13C-155-HxCB	2.00	0.909	45.4	25:11	1.38	
13C-167-HxCB	2.00	0.837	41.8	41:19	1.51 #	
13C-156,157-HxCB	4.00	1.64	41.1	43:05	1.11	
13C-169-HxCB	2.00	0.795	39.7	48:11	0.92 #	
13C-188-HpCB	2.00	0.868	43.4	32:55	1.81 #	
13C-189-HpCB	2.00	1.10	54.9	52:06	1.16	
13C-202-OcCB	2.00	1.02	51.0	40:50	0.72 #	
13C-205-OcCB	2.00	1.21	60.3	56:11	1.00	
13C-208-NoCB	2.00	1.18	58.9	51:13	0.82	
13C-206-NoCB	2.00	1.01	50.5	58:57	1.00 #	
13C-209-DeCB	2.00	0.872	43.6	61:28	1.44 #	
Cleanup Standards			(30-135%)			
13C-28-TrCB	2.00	0.926	46.3	15:46	1.10	
13C-111-PeCB	2.00	0.976	48.8	29:05	1.77	
13C-178-HpCB	2.00	0.726	36.3	37:23	1.29 #	
Injection Standards						
13C-9-DiCB	2.00			9:51	1.78	
13C-52-TeCB	2.00			17:36	0.79	
13C-101-PeCB	2.00			25:32	1.35	
13C-138-HxCB	2.00			36:47	1.10	
13C-194-OcCB	2.00			55:25	0.85	

Analyzed By: AF
Date: 02/09/07

Reviewed By:
Date: 2/9/06

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Method 8290
54SB46A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	2.56			31:21	0.77	
1,2,3,7,8-PeCDD	20.5			34:10	1.47	Q
1,2,3,4,7,8-HxCDD	40.1			36:46	1.24	
1,2,3,6,7,8-HxCDD	114			36:52	1.25	
1,2,3,7,8,9-HxCDD	96.5			37:06	1.26	
1,2,3,4,6,7,8-HpCDD	2520 J,Q			40:10	1.04	E
OCDD	16700 J, Q			44:27	0.89	Q E
2,3,7,8-TCDF	21.4			30:40	0.81	Q
1,2,3,7,8-PeCDF	12.5			33:22	1.57	Q
2,3,4,7,8-PeCDF	23.2			33:58	1.60	Q
1,2,3,4,7,8-HxCDF	53.8			36:03	1.25	
1,2,3,6,7,8-HxCDF	34.6			36:09	1.24	
2,3,4,6,7,8-HxCDF	40.2			36:39	1.24	
1,2,3,7,8,9-HxCDF	9.71			37:25	1.25	
1,2,3,4,6,7,8-HpCDF	820			38:55	1.05	
1,2,3,4,7,8,9-HpCDF	40.2			40:49	1.07	
OCDF	2420			44:43	0.90	
Total TCDDs	37.1		37.6			Q
Total PeCDDs	112					Q
Total HxCDDs	702		703			
Total HpCDDs	4140					
Total TCDFs	219		220			Q
Total PeCDFs	352		355			Q
Total HxCDFs	1120		1130			
Total HpCDFs	2520					
WHO-2005 TEQ (ND=0)	111		111			
WHO-2005 TEQ (ND=½)	111		111			

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB46A		Weight / Volume:	12.63	g
			Solids / Lipids:	80.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14092	
Project ID:	G296-346		Instrument:	HRMS1	
Sample ID:	G296-346-1E		Filename:	a31jan07a_2-12	
Collection Date/Time:	01/09/07	10:30	Retchk:	a31jan07a-6	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	a31jan07a-6	
Extraction Date:	01/29/07		End ConCal:	a31jan07a_2-14	
Analysis Date/Time:	01/31/07	22:22	Initial Cal:	m8290-071006e	

Method 8290
54SB46A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.63	81.4	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.47	73.7	34:10	1.58	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.69	84.5	36:51	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.71	85.4	40:09	1.05	
13C12-OCDD	4.0	3.02	75.5	44:25	0.89	Q
13C12-2,3,7,8-TCDF	2.0	1.97	98.5	30:40	0.79	Q
13C12-1,2,3,7,8-PeCDF	2.0	1.43	71.6	33:21	1.55	Q
13C12-1,2,3,6,7,8-HxCDF	2.0	1.77	88.7	36:09	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.70	84.8	38:54	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.347	86.7	31:21	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.284	71.0	33:58	1.57	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.345	86.1	36:46	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.356	89.1	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.319	79.7	40:49	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:51	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:06	1.24	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB46A		Weight / Volume:	12.63 g	
			Solids / Lipids:	80.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14092	
Project ID:	G296-346		Instrument:	HRMS1	
Sample ID:	G296-346-1E		Filename:	a31jan07a_2-12	
Collection Date/Time:	01/09/07	10:30	Retchk:	a31jan07a-6	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	a31jan07a-6	
Extraction Date:	01/29/07		End ConCal:	a31jan07a_2-14	
Analysis Date/Time:	01/31/07	22:22	Initial Cal:	m8290-071006e	

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02-05-07

Reviewed by: MM
Date: 2/6/07

Method 8290
54SB46C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	0.765			31:19	0.68		A
1,2,3,7,8-PeCDD	EMPC	0.505	4.87 J,W	34:10	1.20	*	A
1,2,3,4,7,8-HxCDD	8.57			36:46	1.24		
1,2,3,6,7,8-HxCDD	27.4			36:51	1.25		
1,2,3,7,8,9-HxCDD	20.5			37:04	1.26		
1,2,3,4,6,7,8-HpCDD	687			40:09	1.05		
OCDD	8600 J,Q			44:24	0.89		E
2,3,7,8-TCDF	6.12			30:40	0.78		
1,2,3,7,8-PeCDF	4.39			33:21	1.61		A
2,3,4,7,8-PeCDF	6.06			33:58	1.57		
1,2,3,4,7,8-HxCDF	15.3			36:03	1.25		
1,2,3,6,7,8-HxCDF	10.1			36:09	1.27		
2,3,4,6,7,8-HxCDF	13.2			36:37	1.29		
1,2,3,7,8,9-HxCDF	2.99			37:25	1.25		A
1,2,3,4,6,7,8-HpCDF	276			38:54	1.05		
1,2,3,4,7,8,9-HpCDF	16.9			40:49	1.06		
OCDF	965			44:42	0.89		
Total TCDDs	11.2		13.8				
Total PeCDDs	23.8		28.7				Q
Total HxCDDs	161						
Total HpCDDs	1130						
Total TCDFs	73.9		74.9				
Total PeCDFs	80.6		80.6				Q
Total HxCDFs	301						
Total HpCDFs	967						
WHO-2005 TEQ (ND=0)	25.8		30.7				
WHO-2005 TEQ (ND=½)	26.1		30.7				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB46C		Weight / Volume:	12.29	g
			Solids / Lipids:	80.6	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14092	
Project ID:	G296-346		Instrument:	HRMS1	
Sample ID:	G296-346-2E		Filename:	a31jan07a_2-13	
Collection Date/Time:	01/09/07	10:45	Retchk:	a31jan07a-6	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	a31jan07a-6	
Extraction Date:	01/29/07		End ConCal:	a31jan07a_2-14	
Analysis Date/Time:	01/31/07	23:10	Initial Cal:	m8290-071006e	

Method 8290
54SB46C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.70	85.1	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.61	80.4	34:09	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.80	90.0	36:51	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.71	85.7	40:07	1.05	
13C12-OCDD	4.0	3.32	82.9	44:22	0.89	
13C12-2,3,7,8-TCDF	2.0	1.97	98.7	30:40	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.66	83.2	33:21	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.86	92.9	36:07	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.76	88.0	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.359	89.8	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.316	79.1	33:58	1.56	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.367	91.8	36:45	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.388	97.0	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.331	82.8	40:49	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.25	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB46C		Weight / Volume:	12.29 g
			Solids / Lipids:	80.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:	G296-346		Instrument:	HRMS1
Sample ID:	G296-346-2E		Filename:	a31jan07a_2-13
Collection Date/Time:	01/09/07	10:45	Retchk:	a31jan07a-6
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	a31jan07a-6
Extraction Date:	01/29/07		End ConCal:	a31jan07a_2-14
Analysis Date/Time:	01/31/07	23:10	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JW
Date: 02-05-07

Reviewed by: CRD
Date: 2/5/07

Method 8290
54SB54C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.129				
1,2,3,7,8-PeCDD	ND	0.486				
1,2,3,4,7,8-HxCDD	ND	0.486				
1,2,3,6,7,8-HxCDD	ND	0.486				
1,2,3,7,8,9-HxCDD	ND	0.486				
1,2,3,4,6,7,8-HpCDD	2.09			39.97	1.00	A
OCDD	57.4 B,Z			44.13	0.89	
2,3,7,8-TCDF	0.282			30.28	0.76	A
1,2,3,7,8-PeCDF	ND	0.486				
2,3,4,7,8-PeCDF	0.0894			33.85	1.48	A
1,2,3,4,7,8-HxCDF	ND	0.486				
1,2,3,6,7,8-HxCDF	ND	0.486				
2,3,4,6,7,8-HxCDF	ND	0.486				
1,2,3,7,8,9-HxCDF	ND	0.486				
1,2,3,4,6,7,8-HpCDF	0.427			38.72	0.91	A
1,2,3,4,7,8,9-HpCDF	ND	0.486				
OCDF	1.00			44.42	0.94	A
Total TCDDs	ND	0.129	1.63			
Total PeCDDs	ND	0.486				
Total HxCDDs	0.690					
Total HpCDDs	6.83					
Total TCDFs	0.282		0.542			
Total PeCDFs	0.134		0.402			
Total HxCDFs	ND	0.486	0.163			
Total HpCDFs	0.954					
WHO-2005 TEQ (ND=0)	0.0977		0.0977			
WHO-2005 TEQ (ND=½)	0.585		0.585			

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB54C		Weight / Volume:	12.30	g
			Solids / Lipids:	83.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14062	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-3B		Filename:	c26jan07d-7	
Collection Date/Time:	01/09/07	10:05	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/11/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	19:23	Initial Cal:	m8290-c110206a	

Method 8290
54SB54C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.09	54.6	31.06	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.32	65.9	34.03	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.47	73.7	36.70	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.48	74.1	39.94	1.04	
13C12-OCDD	4.0	1.65	41.3	44.10	0.91	
13C12-2,3,7,8-TCDF	2.0	1.43	71.6	30.25	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.32	66.0	33.22	1.64	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.42	71.0	35.99	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.46	73.0	38.71	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.259	64.6	31.08	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.298	74.6	33.84	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.260	65.0	36.61	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.304	76.0	35.90	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.304	76.1	40.59	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.45	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.93	1.34	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB54C		Weight / Volume:	12.30	g
			Solids / Lipids:	83.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14062	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-3B		Filename:	c26jan07d-7	
Collection Date/Time:	01/09/07	10:05	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/11/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	19:23	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02FEB07

Reviewed by: [illegible]
Date: 2/3/07

Method 8290
54SB45B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.0913				
1,2,3,7,8-PeCDD	ND	0.457				
1,2,3,4,7,8-HxCDD	ND	0.592				
1,2,3,6,7,8-HxCDD	ND	0.605				
1,2,3,7,8,9-HxCDD	ND	0.653				
1,2,3,4,6,7,8-HpCDD	2.04			39.94	1.12	A
OCDD	47.8			44.10	0.94	
2,3,7,8-TCDF	0.298			30.25	0.82	A
1,2,3,7,8-PeCDF	0.141			33.21	1.39	A
2,3,4,7,8-PeCDF	0.225 B,Z			33.84	1.54	A
1,2,3,4,7,8-HxCDF	0.142			35.90	1.10	A
1,2,3,6,7,8-HxCDF	0.139			36.01	1.27	A
2,3,4,6,7,8-HxCDF	0.413			36.47	1.12	A
1,2,3,7,8,9-HxCDF	ND	0.457				
1,2,3,4,6,7,8-HpCDF	0.888			38.70	1.12	A
1,2,3,4,7,8,9-HpCDF	ND	0.457				
OCDF	0.575 B,Z			44.37	0.98	A
Total TCDDs	ND	0.0913	3.08			
Total PeCDDs	1.32					
Total HxCDDs	0.866					
Total HpCDDs	6.29					
Total TCDFs	1.34		1.83			
Total PeCDFs	1.40		1.65			
Total HxCDFs	1.39		1.61			
Total HpCDFs	0.888		1.12			
WHO-2005 TEQ (ND=0)	0.215		0.215			
WHO-2005 TEQ (ND=½)	0.606		0.606			

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB45B		Weight / Volume:	12.83	g
			Solids / Lipids:	85.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14072	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-4B		Filename:	c26jan07d-8	
Collection Date/Time:	01/09/07	9:18	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/17/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	20:11	Initial Cal:	m8290-c110206a	

Method 8290
54SB45B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.46	73.2	31.05	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.47	73.4	34.01	1.55	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.54	77.1	36.67	1.28	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.60	79.8	39.92	1.04	
13C12-OCDD	4.0	1.99	49.7	44.08	0.86	
13C12-2,3,7,8-TCDF	2.0	1.89	94.6	30.22	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.58	78.8	33.20	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.52	75.8	35.97	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.61	80.5	38.69	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.325	81.2	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.317	79.2	33.81	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.277	69.2	36.58	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.307	76.8	35.88	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.309	77.2	40.58	0.48	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.26	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB45B		Weight / Volume:	12.83 g
			Solids / Lipids:	85.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14072
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-4B		Filename:	c26jan07d-8
Collection Date/Time:	01/09/07	9:18	Retchk:	c26jan07d-1
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1
Extraction Date:	01/17/07		End ConCal:	c26jan07d-15
Analysis Date/Time:	01/26/07	20:11	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.12]Report

Analyzed by: HMP
Date: 06Mar07

Reviewed by: [illegible]
Date: 3/4/07

Method 8290
54SB54A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.104					
1,2,3,7,8-PeCDD	ND	0.522					
1,2,3,4,7,8-HxCDD	ND	0.615					
1,2,3,6,7,8-HxCDD	ND	0.628					
1,2,3,7,8,9-HxCDD	ND	0.678					
1,2,3,4,6,7,8-HpCDD	2.94			39.94	1.16		A
OCDD	122			44.10	0.90		
2,3,7,8-TCDF	0.265			30.26	0.82		A
1,2,3,7,8-PeCDF	ND	0.522					
2,3,4,7,8-PeCDF	0.0710 BJ Z			33.84	1.66		A
1,2,3,4,7,8-HxCDF	ND	0.522					
1,2,3,6,7,8-HxCDF	ND	0.522					
2,3,4,6,7,8-HxCDF	ND	0.522					
1,2,3,7,8,9-HxCDF	ND	0.522					
1,2,3,4,6,7,8-HpCDF	EMPC	0.522	0.376 JW	38.72	0.82	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.522					
OCDF	ND	1.04					
Total TCDDs	ND	0.104					
Total PeCDDs	ND	0.522					
Total HxCDDs	ND	0.678					
Total HpCDDs	12.3						
Total TCDFs	0.551		0.614				
Total PeCDFs	0.140 BJ Z						
Total HxCDFs	0.278						
Total HpCDFs	ND	0.522	0.835				
WHO-2005 TEQ (ND=0)	0.114		0.118				
WHO-2005 TEQ (ND=½)	0.640		0.642				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB54A		Weight / Volume:	11.78	g
			Solids / Lipids:	81.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14072	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-5B		Filename:	c26jan07d-9	
Collection Date/Time:	01/09/07	9:45	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/17/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	21:00	Initial Cal:	m8290-c110206a	

Method 8290
54SB54A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.46	72.8	31.05	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.52	76.1	34.01	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.67	83.5	36.69	1.23	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.71	85.4	39.93	1.04	
13C12-OCDD	4.0	2.25	56.3	44.08	0.88	
13C12-2,3,7,8-TCDF	2.0	1.92	96.2	30.23	0.82	
13C12-1,2,3,7,8-PeCDF	2.0	1.57	78.7	33.21	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.61	80.5	35.98	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.71	85.7	38.70	0.48	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.323	80.7	31.07	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.320	80.0	33.83	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.326	81.5	36.60	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.324	80.9	35.88	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.330	82.6	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.27	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB54A		Weight / Volume:	11.78 g	
			Solids / Lipids:	81.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14072	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-5B		Filename:	c26jan07d-9	
Collection Date/Time:	01/09/07	9:45	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/17/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	21:00	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: MRL
Date: 2/9/07

Method 8290
54SB45A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0795					
1,2,3,7,8-PeCDD	ND	0.397					
1,2,3,4,7,8-HxCDD	ND	0.494					
1,2,3,6,7,8-HxCDD	ND	0.505					
1,2,3,7,8,9-HxCDD	ND	0.545					
1,2,3,4,6,7,8-HpCDD	1.83			39.94	0.98		A
OCDD	70.0			44.10	0.88		
2,3,7,8-TCDF	0.221			30.25	0.75		A
1,2,3,7,8-PeCDF	ND	0.397					
2,3,4,7,8-PeCDF	ND	0.397					
1,2,3,4,7,8-HxCDF	ND	0.397					
1,2,3,6,7,8-HxCDF	ND	0.397					
2,3,4,6,7,8-HxCDF	ND	0.397					
1,2,3,7,8,9-HxCDF	ND	0.397					
1,2,3,4,6,7,8-HpCDF	EMPC	0.397	0.223 J,W	38.72	0.79	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.397					
OCDF	0.382 B,J,Z			44.40	0.87		A
Total TCDDs	ND	0.0795					
Total PeCDDs	ND	0.397	0.122				
Total HxCDDs	ND	0.545					
Total HpCDDs	7.02						
Total TCDFs	0.356		0.437				
Total PeCDFs	ND	0.397	0.0397				
Total HxCDFs	0.0811						
Total HpCDFs	0.235 B,J,Z		0.458				
WHO-2005 TEQ (ND=0)	0.0615		0.0637				
WHO-2005 TEQ (ND=½)	0.526		0.526				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB45A		Weight / Volume:	14.58	g
			Solids / Lipids:	86.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14072	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-6B		Filename:	c26jan07d-10	
Collection Date/Time:	01/09/07	9:14	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/17/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	21:48	Initial Cal:	m8290-c110206a	

Method 8290
54SB45A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.42	70.9	31.06	0.76	
13C12-1,2,3,7,8-PeCDD	2.0	1.44	71.9	34.01	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.63	81.6	36.69	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.63	81.5	39.93	1.08	
13C12-OCDD	4.0	2.13	53.2	44.09	0.91	
13C12-2,3,7,8-TCDF	2.0	1.88	94.1	30.23	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.56	78.0	33.21	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.64	82.1	35.98	0.55	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.71	85.4	38.70	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.312	78.1	31.07	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.315	78.8	33.83	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.314	78.4	36.60	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.328	82.0	35.88	0.58	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.322	80.4	40.58	0.47	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.45	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.28	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB45A		Weight / Volume:	14.58 g	
			Solids / Lipids:	86.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14072	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-6B		Filename:	c26jan07d-10	
Collection Date/Time:	01/09/07	9:14	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/17/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	21:48	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by:
Date: 2/2/07

Method 8290
54SB54B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0963					
1,2,3,7,8-PeCDD	ND	0.482					
1,2,3,4,7,8-HxCDD	ND	0.482					
1,2,3,6,7,8-HxCDD	ND	0.482					
1,2,3,7,8,9-HxCDD	ND ~~EMPC~~	0.482	~~0.181~~	36.93	0.87	*	A
1,2,3,4,6,7,8-HpCDD	2.15			39.96	1.07		A
OCDD	67.1			44.10	0.90		
2,3,7,8-TCDF	EMPC	0.0963	0.277 JW	30.26	0.92	*	A
1,2,3,7,8-PeCDF	ND	0.482					
2,3,4,7,8-PeCDF	ND ~~EMPC~~	0.482	~~0.0751~~	33.85	1.13	*	A
1,2,3,4,7,8-HxCDF	ND	0.482					
1,2,3,6,7,8-HxCDF	ND	0.482					
2,3,4,6,7,8-HxCDF	ND	0.482					
1,2,3,7,8,9-HxCDF	ND	0.482					
1,2,3,4,6,7,8-HpCDF	0.222 BJZ			38.72	1.14		A
1,2,3,4,7,8,9-HpCDF	ND	0.482					
OCDF	0.300 BJZ			44.39	0.91		A
Total TCDDs	ND	0.0963					
Total PeCDDs	0.302		0.518				
Total HxCDDs	0.898		1.42				
Total HpCDDs	6.77						
Total TCDFs	ND	0.0963	0.622				
Total PeCDFs	ND	0.482	0.235				
Total HxCDFs	0.0539		0.135				
Total HpCDFs	0.222 BJZ						
WHO-2005 TEQ (ND=0)	0.0439		0.112				
WHO-2005 TEQ (ND=½)	0.588		0.555				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB54B		Weight / Volume:	12.27	g
			Solids / Lipids:	84.6	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14072	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-7B		Filename:	c26jan07d-11	
Collection Date/Time:	01/09/07	9:55	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/17/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	22:36	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB54B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.45	72.5	31.06	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.42	70.8	34.03	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.60	80.1	36.69	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.60	79.9	39.93	1.03	
13C12-OCDD	4.0	2.15	53.7	44.09	0.89	
13C12-2,3,7,8-TCDF	2.0	1.86	93.1	30.23	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.56	78.1	33.21	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.63	81.4	35.98	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.62	81.1	38.70	0.47	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.318	79.4	31.07	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.311	77.7	33.83	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.289	72.3	36.60	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.332	83.1	35.88	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.308	77.1	40.58	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.45	0.82	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.24	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB54B		Weight / Volume:	12.27 g
			Solids / Lipids:	84.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14072
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-7B		Filename:	c26jan07d-11
Collection Date/Time:	01/09/07	9:55	Retchk:	c26jan07d-1
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1
Extraction Date:	01/17/07		End ConCal:	c26jan07d-15
Analysis Date/Time:	01/26/07	22:36	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by:
Date: 2/2/07

Method 8290
54SB45C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0984					
1,2,3,7,8-PeCDD	ND	0.492					
1,2,3,4,7,8-HxCDD	ND	0.492					
1,2,3,6,7,8-HxCDD	ND	0.492					
1,2,3,7,8,9-HxCDD	~~EMPC~~ ND	0.492	~~0.104~~	36.93	0.92	*	A
1,2,3,4,6,7,8-HpCDD	1.15			39.94	1.01		A
OCDD	29.2			44.11	0.91		
2,3,7,8-TCDF	0.274 BJZ			30.28	0.86		A
1,2,3,7,8-PeCDF	ND	0.492					
2,3,4,7,8-PeCDF	ND	0.492					
1,2,3,4,7,8-HxCDF	ND	0.492					
1,2,3,6,7,8-HxCDF	ND	0.492					
2,3,4,6,7,8-HxCDF	ND	0.492					
1,2,3,7,8,9-HxCDF	ND	0.492					
1,2,3,4,6,7,8-HpCDF	0.148			38.71	0.90		A
1,2,3,4,7,8,9-HpCDF	ND	0.492					
OCDF	ND	0.984					
Total TCDDs	ND	0.0984					
Total PeCDDs	0.356		0.634				
Total HxCDDs	0.793		0.898				
Total HpCDDs	3.26						
Total TCDFs	0.425 BJZ		0.569				
Total PeCDFs	0.0276						
Total HxCDFs	0.120						
Total HpCDFs	0.148						
WHO-2005 TEQ (ND=0)	0.0491		0.0595				
WHO-2005 TEQ (ND=½)	0.601		0.586				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB45C		Weight / Volume:	11.50	g
			Solids / Lipids:	88.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-8C		Filename:	c26jan07d-12	
Collection Date/Time:	01/09/07	9:23	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/18/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	23:25	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB45C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.39	69.4	31.06	0.76	
13C12-1,2,3,7,8-PeCDD	2.0	1.44	71.8	34.03	1.66	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.62	80.8	36.70	1.29	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.64	81.8	39.93	1.09	
13C12-OCDD	4.0	1.99	49.8	44.09	0.87	
13C12-2,3,7,8-TCDF	2.0	1.80	90.0	30.23	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.55	77.3	33.22	1.61	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.68	84.1	35.99	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.65	82.3	38.71	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.295	73.8	31.08	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.299	74.9	33.84	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.275	68.8	36.61	1.32	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.333	83.2	35.90	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.327	81.8	40.59	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.45	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.93	1.29	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB45C		Weight / Volume:	11.50	g
			Solids / Lipids:	88.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-8C		Filename:	c26jan07d-12	
Collection Date/Time:	01/09/07	9:23	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/18/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	23:25	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: [illegible]
Date: 2/5/07

Method 8290
54SB41C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.103					
1,2,3,7,8-PeCDD	ND	0.493					
1,2,3,4,7,8-HxCDD	ND	0.493					
1,2,3,6,7,8-HxCDD	ND	0.493					
1,2,3,7,8,9-HxCDD	0.323			36.94	1.11		A
1,2,3,4,6,7,8-HpCDD	1.47			39.96	1.07		A
OCDD	49.5			44.12	0.97		
2,3,7,8-TCDF	0.262 B,J,E			30.23	0.66		A
1,2,3,7,8-PeCDF	ND	0.493					
2,3,4,7,8-PeCDF	EMPC	0.493	0.0670 J,N	33.86	1.24	*	A
1,2,3,4,7,8-HxCDF	ND	0.493					
1,2,3,6,7,8-HxCDF	ND	0.493					
2,3,4,6,7,8-HxCDF	ND	0.493					
1,2,3,7,8,9-HxCDF	ND	0.493					
1,2,3,4,6,7,8-HpCDF	ND	0.493					
1,2,3,4,7,8,9-HpCDF	ND	0.493					
OCDF	ND	0.985					
Total TCDDs	ND	0.103	0.341				
Total PeCDDs	0.402		0.573				
Total HxCDDs	1.06		1.32				
Total HpCDDs	4.31						
Total TCDFs	0.402 B,J,E		0.491				
Total PeCDFs	ND	0.493	0.106				
Total HxCDFs	0.0532						
Total HpCDFs	ND	0.493					
WHO-2005 TEQ (ND=0)	0.0881		0.108				
WHO-2005 TEQ (ND=½)	0.620		0.566				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB41C		Weight / Volume:	12.11	g
			Solids / Lipids:	83.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-9C		Filename:	c26jan07d-13	
Collection Date/Time:	01/09/07	9:00	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/18/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/27/07	0:13	Initial Cal:	m8290-c110206a	

Method 8290
54SB41C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.29	64.7	31.06	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.39	69.7	34.03	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.56	78.0	36.70	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.52	76.2	39.93	1.11	
13C12-OCDD	4.0	1.62	40.6	44.10	0.93	
13C12-2,3,7,8-TCDF	2.0	1.75	87.7	30.25	0.81	
13C12-1,2,3,7,8-PeCDF	2.0	1.50	75.1	33.22	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.63	81.7	35.99	0.55	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.58	79.1	38.71	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.304	76.1	31.08	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.309	77.3	33.84	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.284	71.0	36.62	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.340	84.9	35.90	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.311	77.9	40.59	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.45	0.82	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.93	1.34	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB41C		Weight / Volume:	12.11 g
			Solids / Lipids:	83.8 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-9C		Filename:	c26jan07d-13
Collection Date/Time:	01/09/07	9:00	Retchk:	c26jan07d-1
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1
Extraction Date:	01/18/07		End ConCal:	c26jan07d-15
Analysis Date/Time:	01/27/07	0:13	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: CHL
Date: 2/8/07

Method 8290
54SB41B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0888					
1,2,3,7,8-PeCDD	ND	0.444					
1,2,3,4,7,8-HxCDD	ND	0.444					
1,2,3,6,7,8-HxCDD	ND	0.444					
1,2,3,7,8,9-HxCDD	ND	0.444					
1,2,3,4,6,7,8-HpCDD	EMPC	0.444	0.547 JW	39.94	1.23	*	A
OCDD	2.17 BJZ			44.11	0.89		A
2,3,7,8-TCDF	0.236 BJZ			30.26	0.82		A
1,2,3,7,8-PeCDF	ND	0.444					
2,3,4,7,8-PeCDF	0.0710			33.84	1.36		A
1,2,3,4,7,8-HxCDF	ND	0.444					
1,2,3,6,7,8-HxCDF	ND	0.444					
2,3,4,6,7,8-HxCDF	ND	0.444					
1,2,3,7,8,9-HxCDF	ND	0.444					
1,2,3,4,6,7,8-HpCDF	ND	0.444					
1,2,3,4,7,8,9-HpCDF	ND	0.444					
OCDF	ND	0.888					
Total TCDDs	ND	0.0888	0.245				
Total PeCDDs	0.277		0.423				
Total HxCDDs	ND	0.444					
Total HpCDDs	0.577		1.12				
Total TCDFs	0.437 BJZ		0.641				
Total PeCDFs	0.176		0.238				
Total HxCDFs	0.105						
Total HpCDFs	ND	0.444					
WHO-2005 TEQ (ND=0)	0.0456		0.0510				
WHO-2005 TEQ (ND=½)	0.481		0.484				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB41B		Weight / Volume:	12.91	g
			Solids / Lipids:	87.2	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-10C		Filename:	c26jan07d-14	
Collection Date/Time:	01/09/07	8:55	Retchk:	c26jan07d-1	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1	
Extraction Date:	01/18/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/27/07	1:01	Initial Cal:	m8290-c110206a	

Method 8290
54SB41B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.42	70.9	31.05	0.83	
13C12-1,2,3,7,8-PeCDD	2.0	1.51	75.3	34.01	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.65	82.3	36.67	1.29	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.64	82.0	39.92	1.10	
13C12-OCDD	4.0	2.08	51.9	44.09	0.93	
13C12-2,3,7,8-TCDF	2.0	1.88	94.2	30.23	0.81	
13C12-1,2,3,7,8-PeCDF	2.0	1.65	82.7	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.70	85.1	35.98	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.71	85.3	38.69	0.48	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.309	77.3	31.07	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.324	81.0	33.83	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.299	74.6	36.60	1.31	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.348	86.9	35.88	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.327	81.6	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.32	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB41B		Weight / Volume:	12.91 g
			Solids / Lipids:	87.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-10C		Filename:	c26jan07d-14
Collection Date/Time:	01/09/07	8:55	Retchk:	c26jan07d-1
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-1
Extraction Date:	01/18/07		End ConCal:	c26jan07d-15
Analysis Date/Time:	01/27/07	1:01	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: VNP
Date: 2/2/07

Method 8290
54SB42B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	0.800			31.06	0.78	A
1,2,3,7,8-PeCDD	2.36			34.04	1.53	A
1,2,3,4,7,8-HxCDD	1.94			36.62	1.32	A
1,2,3,6,7,8-HxCDD	4.72			36.70	1.24	A
1,2,3,7,8,9-HxCDD	4.41			36.93	1.39	A
1,2,3,4,6,7,8-HpCDD	113			39.96	1.05	
OCDD	1050			44.11	0.89	
2,3,7,8-TCDF	6.66			30.26	0.75	
1,2,3,7,8-PeCDF	7.40			33.22	1.55	
2,3,4,7,8-PeCDF	8.62			33.84	1.45	
1,2,3,4,7,8-HxCDF	8.26			35.91	1.26	
1,2,3,6,7,8-HxCDF	7.05			36.01	1.25	
2,3,4,6,7,8-HxCDF	5.49			36.49	1.26	
1,2,3,7,8,9-HxCDF	2.55			37.26	1.22	A
1,2,3,4,6,7,8-HpCDF	28.0			38.71	1.04	
1,2,3,4,7,8,9-HpCDF	3.20			40.60	0.96	A
OCDF	69.5			44.39	0.91	
Total TCDDs	9.74		12.8			
Total PeCDDs	19.6					
Total HxCDDs	35.9		36.9			
Total HpCDDs	247					
Total TCDFs	83.6		86.2			
Total PeCDFs	55.7		60.2			
Total HxCDFs	56.4					
Total HpCDFs	77.7					
WHO-2005 TEQ (ND=0)	11.9		11.9			
WHO-2005 TEQ (ND=½)	11.9		11.9			

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB42B		Weight / Volume:	12.16	g
			Solids / Lipids:	82.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-11C		Filename:	c26jan07d_2-2	
Collection Date/Time:	01/08/07	16:15	Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	3:33	Initial Cal:	m8290-c110206a	

Method 8290
54SB42B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.51	75.4	31.06	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.47	73.7	34.01	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.68	84.0	36.69	1.32	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.73	86.5	39.93	1.07	
13C12-OCDD	4.0	2.35	58.8	44.09	0.91	
13C12-2,3,7,8-TCDF	2.0	1.95	97.5	30.22	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.63	81.5	33.21	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.78	89.0	35.98	0.55	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.76	88.0	38.70	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.327	81.8	31.07	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.321	80.3	33.83	1.66	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.297	74.3	36.60	1.32	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.346	86.4	35.90	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.324	81.0	40.59	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.39	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB42B		Weight / Volume:	12.16 g	
			Solids / Lipids:	82.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-11C		Filename:	c26jan07d_2-2	
Collection Date/Time:	01/08/07	16:15	Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	3:33	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: [signature]
Date: 2/1/07

Method 8290
54SB42C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0889					
1,2,3,7,8-PeCDD	0.135			34.03	1.68		A
1,2,3,4,7,8-HxCDD	ND	0.445					
1,2,3,6,7,8-HxCDD	ND	0.445					
1,2,3,7,8,9-HxCDD	0.164			36.93	1.15		A
1,2,3,4,6,7,8-HpCDD	1.08			39.94	1.02		A
OCDD	18.7 BTE			44.10	0.88		
2,3,7,8-TCDF	EMPC	0.145	0.459 JW	30.26	0.95	*	A
1,2,3,7,8-PeCDF	0.237			33.22	1.76		A
2,3,4,7,8-PeCDF	0.466			33.85	1.59		A
1,2,3,4,7,8-HxCDF	ND ~~EMPC~~	0.445	~~0.309~~	35.91	1.64	*	A
1,2,3,6,7,8-HxCDF	ND ~~EMPC~~	0.445	~~0.281~~	36.01	1.57	*	A
2,3,4,6,7,8-HxCDF	0.302			36.49	1.34		A
1,2,3,7,8,9-HxCDF	ND	0.445					
1,2,3,4,6,7,8-HpCDF	0.790			38.72	1.03		A
1,2,3,4,7,8,9-HpCDF	ND	0.445					
OCDF	0.407			44.40	0.83		A
Total TCDDs	ND	0.0889					
Total PeCDDs	1.11						
Total HxCDDs	0.706		1.05				
Total HpCDDs	3.03						
Total TCDFs	1.60		2.66				
Total PeCDFs	2.05		2.25				
Total HxCDFs	0.740		1.82				
Total HpCDFs	0.790						
WHO-2005 TEQ (ND=0)	0.353		0.458				
WHO-2005 TEQ (ND=½)	0.518		0.571				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB42C		Weight / Volume:	12.79	g
			Solids / Lipids:	87.9	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-12C		Filename:	c26jan07d_2-3	
Collection Date/Time:	01/08/07	16:25	Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	4:22	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB42C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.39	69.7	31.06	0.82	
13C12-1,2,3,7,8-PeCDD	2.0	1.40	70.2	34.03	1.53	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.57	78.7	36.69	1.28	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.54	76.8	39.93	1.08	
13C12-OCDD	4.0	1.92	47.9	44.10	0.91	
13C12-2,3,7,8-TCDF	2.0	1.77	88.5	30.23	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.49	74.3	33.21	1.61	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.59	79.4	35.99	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.58	79.0	38.71	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.297	74.1	31.07	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.299	74.9	33.84	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.264	66.0	36.61	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.309	77.3	35.90	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.307	76.7	40.59	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.45	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.93	1.24	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB42C		Weight / Volume:	12.79 g
			Solids / Lipids:	87.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-12C		Filename:	c26jan07d_2-3
Collection Date/Time:	01/08/07	16:25	Retchk:	c26jan07d-15
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14
Analysis Date/Time:	01/27/07	4:22	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: DB
Date: 2/2/07

Method 8290
Dup-1
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	0.0902	0.179 J,W	31.06	0.65	*	A
1,2,3,7,8-PeCDD	EMPC	0.451	0.420 J,W	34.03	1.21	*	A
1,2,3,4,7,8-HxCDD	0.606			36.60	1.31		A
1,2,3,6,7,8-HxCDD	1.77			36.69	1.30		A
1,2,3,7,8,9-HxCDD	1.45			36.93	1.06		A
1,2,3,4,6,7,8-HpCDD	73.2			39.93	1.06		
OCDD	3890			44.10	0.87		E
2,3,7,8-TCDF	0.863 JF			30.25	0.80		A
1,2,3,7,8-PeCDF	0.489			33.20	1.68		A
2,3,4,7,8-PeCDF	1.25			33.83	1.73		A
1,2,3,4,7,8-HxCDF	1.82			35.88	1.19		A
1,2,3,6,7,8-HxCDF	1.33			35.99	1.39		A
2,3,4,6,7,8-HxCDF	1.87			36.47	1.22		A
1,2,3,7,8,9-HxCDF	0.491			37.26	1.29		A
1,2,3,4,6,7,8-HpCDF	12.2			38.70	1.03		
1,2,3,4,7,8,9-HpCDF	0.908			40.59	0.99		A
OCDF	26.4			44.39	0.83		
Total TCDDs	0.170		0.816				
Total PeCDDs	3.37		4.10				
Total HxCDDs	14.5		16.7				
Total HpCDDs	248						
Total TCDFs	7.69		9.15				
Total PeCDFs	7.88		9.32				
Total HxCDFs	16.6		16.7				
Total HpCDFs	33.2		34.2				
WHO-2005 TEQ (ND=0)	3.45		4.05				
WHO-2005 TEQ (ND=½)	3.72		4.05				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	Dup-1		Weight / Volume:	13.59	g
			Solids / Lipids:	81.6	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-13C		Filename:	c26jan07d_2-4	
Collection Date/Time:	01/08/07		Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	5:10	Initial Cal:	m8290-c110206a	

Method 8290
Dup-1
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.35	67.5	31.05	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.37	68.4	34.01	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.48	74.2	36.67	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.46	73.1	39.92	1.09	
13C12-OCDD	4.0	2.35	58.6	44.08	0.87	
13C12-2,3,7,8-TCDF	2.0	1.76	87.8	30.22	0.81	
13C12-1,2,3,7,8-PeCDF	2.0	1.54	77.1	33.20	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.55	77.4	35.97	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.53	76.5	38.69	0.47	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.286	71.5	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.304	75.9	33.81	1.65	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.266	66.4	36.60	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.309	77.4	35.87	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.285	71.3	40.58	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.27	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	Dup-1		Weight / Volume:	13.59 g
			Solids / Lipids:	81.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-13C		Filename:	c26jan07d_2-4
Collection Date/Time:	01/08/07		Retchk:	c26jan07d-15
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14
Analysis Date/Time:	01/27/07	5:10	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: CLC
Date: 2/1/07

Method 8290
Dup-4
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0966					
1,2,3,7,8-PeCDD	ND	0.483					
1,2,3,4,7,8-HxCDD	ND	0.483					
1,2,3,6,7,8-HxCDD	ND	0.483					
1,2,3,7,8,9-HxCDD	ND	0.483					
1,2,3,4,6,7,8-HpCDD	1.30			39.96	1.03		A
OCDD	40.2			44.10	0.89		
2,3,7,8-TCDF	EMPC	0.0966	0.224 JW	30.26	0.94	*	A
1,2,3,7,8-PeCDF	ND	0.483					
2,3,4,7,8-PeCDF	ND	0.483					
1,2,3,4,7,8-HxCDF	ND	0.483					
1,2,3,6,7,8-HxCDF	ND	0.483					
2,3,4,6,7,8-HxCDF	ND	0.483					
1,2,3,7,8,9-HxCDF	ND	0.483					
1,2,3,4,6,7,8-HpCDF	ND	0.483					
1,2,3,4,7,8,9-HpCDF	ND	0.483					
OCDF	ND ~~EMPC~~	0.966	~~0.0715~~	44.40	0.49	*	A
Total TCDDs	ND	0.0966					
Total PeCDDs	0.137						
Total HxCDDs	0.299						
Total HpCDDs	4.37						
Total TCDFs	0.212 BJF		0.437				
Total PeCDFs	ND	0.483					
Total HxCDFs	0.0367						
Total HpCDFs	ND	0.483					
WHO-2005 TEQ (ND=0)	0.0251		0.0475				
WHO-2005 TEQ (ND=½)	0.573		0.591				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	Dup-4		Weight / Volume:	12.02	g
			Solids / Lipids:	86.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-14B		Filename:	c26jan07d_2-5	
Collection Date/Time:	01/09/07		Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	5:58	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
Dup-4
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.48	74.0	31.05	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.49	74.3	34.01	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.65	82.7	36.67	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.61	80.4	39.92	1.06	
13C12-OCDD	4.0	1.98	49.4	44.09	0.90	
13C12-2,3,7,8-TCDF	2.0	1.96	98.1	30.22	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.63	81.6	33.20	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.73	86.5	35.98	0.55	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.66	83.0	38.70	0.47	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.316	78.9	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.330	82.6	33.81	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.277	69.1	36.60	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.331	82.7	35.88	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.320	80.0	40.57	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.82	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.33	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	Dup-4		Weight / Volume:	12.02 g
			Solids / Lipids:	86.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-14B		Filename:	c26jan07d_2-5
Collection Date/Time:	01/09/07		Retchk:	c26jan07d-15
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14
Analysis Date/Time:	01/27/07	5:58	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: [illegible]
Date: 2/1/07

Method 8290
54SB77B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0972					
1,2,3,7,8-PeCDD	ND	0.486					
1,2,3,4,7,8-HxCDD	ND	0.486					
1,2,3,6,7,8-HxCDD	ND	0.486					
1,2,3,7,8,9-HxCDD	ND	0.486					
1,2,3,4,6,7,8-HpCDD	1.01			39.96	1.04		A
OCDD	32.3			44.10	0.96		
2,3,7,8-TCDF	EMPC	0.0972	0.290 JW	30.23	0.64	*	A
1,2,3,7,8-PeCDF	ND	0.486					
2,3,4,7,8-PeCDF	~~EMPC~~ ND	0.486	~~0.0583~~	33.83	1.12	*	A
1,2,3,4,7,8-HxCDF	ND	0.486					
1,2,3,6,7,8-HxCDF	ND	0.486					
2,3,4,6,7,8-HxCDF	ND	0.486					
1,2,3,7,8,9-HxCDF	ND	0.486					
1,2,3,4,6,7,8-HpCDF	0.187			38.70	1.04		A
1,2,3,4,7,8,9-HpCDF	ND	0.486					
OCDF	ND	0.972					
Total TCDDs	ND	0.0972					
Total PeCDDs	ND	0.486					
Total HxCDDs	0.383						
Total HpCDDs	3.32						
Total TCDFs	0.194 BJ		0.595				
Total PeCDFs	ND	0.486	0.0583				
Total HxCDFs	ND	0.486					
Total HpCDFs	0.187						
WHO-2005 TEQ (ND=0)	0.0217		0.0682				
WHO-2005 TEQ (ND=½)	0.571		0.540				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB77B		Weight / Volume:	12.31	g
			Solids / Lipids:	83.6	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-15B		Filename:	c26jan07d_2-6	
Collection Date/Time:	01/09/07	15:20	Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	6:46	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB77B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.31	65.6	31.05	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.38	69.0	34.01	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.56	77.9	36.69	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.48	74.2	39.93	1.07	
13C12-OCDD	4.0	1.74	43.5	44.09	0.93	
13C12-2,3,7,8-TCDF	2.0	1.74	86.8	30.22	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.50	75.1	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.59	79.3	35.98	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.57	78.3	38.70	0.47	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.297	74.3	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.306	76.4	33.83	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.261	65.3	36.60	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.312	78.1	35.87	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.298	74.5	40.58	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.82	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.26	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB77B		Weight / Volume:	12.31 g
			Solids / Lipids:	83.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-15B		Filename:	c26jan07d_2-6
Collection Date/Time:	01/09/07	15:20	Retchk:	c26jan07d-15
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14
Analysis Date/Time:	01/27/07	6:46	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: GPD
Date: 2/2/07

Method 8290
54SB77C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0967					
1,2,3,7,8-PeCDD	ND	0.483					
1,2,3,4,7,8-HxCDD	ND	0.483					
1,2,3,6,7,8-HxCDD	ND	0.483					
1,2,3,7,8,9-HxCDD	ND	0.483					
1,2,3,4,6,7,8-HpCDD	1.06			39.93	1.03		A
OCDD	29.8			44.10	0.93		
2,3,7,8-TCDF	0.248 B,Z			30.23	0.88		A
1,2,3,7,8-PeCDF	ND	0.483					
2,3,4,7,8-PeCDF	EMPC	0.483	0.0696 J,W	33.85	1.94	*	A
1,2,3,4,7,8-HxCDF	ND	0.483					
1,2,3,6,7,8-HxCDF	ND	0.483					
2,3,4,6,7,8-HxCDF	ND	0.483					
1,2,3,7,8,9-HxCDF	ND	0.483					
1,2,3,4,6,7,8-HpCDF	EMPC	0.483	0.120 J,W	38.72	1.20	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.483					
OCDF	ND ~~EMPC~~	0.967	~~0.141~~	44.37	1.36	*	A
Total TCDDs	ND	0.0967	0.0271				
Total PeCDDs	ND	0.483	0.120				
Total HxCDDs	0.364		0.513				
Total HpCDDs	3.39						
Total TCDFs	0.391 B,Z		0.476				
Total PeCDFs	0.0851		0.155				
Total HxCDFs	ND	0.483	0.132				
Total HpCDFs	ND	0.483	0.120				
WHO-2005 TEQ (ND=0)	0.0443		0.0665				
WHO-2005 TEQ (ND=½)	0.588		0.535				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB77C		Weight / Volume:	12.06	g
			Solids / Lipids:	85.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-16B		Filename:	c26jan07d_2-7	
Collection Date/Time:	01/09/07	15:30	Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	7:34	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB77C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.38	69.0	31.05	0.83	
13C12-1,2,3,7,8-PeCDD	2.0	1.44	72.1	34.01	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.65	82.3	36.69	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.63	81.3	39.93	1.07	
13C12-OCDD	4.0	2.04	51.0	44.09	0.92	
13C12-2,3,7,8-TCDF	2.0	1.83	91.6	30.22	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.58	78.9	33.21	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.71	85.4	35.98	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.69	84.3	38.70	0.47	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.301	75.2	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.316	79.1	33.83	1.64	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.263	65.8	36.60	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.325	81.1	35.88	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.320	79.9	40.58	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.82	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.25	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB77C		Weight / Volume:	12.06 g
			Solids / Lipids:	85.8 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-16B		Filename:	c26jan07d_2-7
Collection Date/Time:	01/09/07	15:30	Retchk:	c26jan07d-15
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14
Analysis Date/Time:	01/27/07	7:34	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: [illegible]
Date: 2/1/07

Method 8290
54SB53A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	0.454			31.06	0.82		A
1,2,3,7,8-PeCDD	ND ~~EMPC~~	0.453	~~0.932~~	34.03	0.94	*	A
1,2,3,4,7,8-HxCDD	0.835			36.60	1.38		A
1,2,3,6,7,8-HxCDD	2.41			36.69	1.24		A
1,2,3,7,8,9-HxCDD	2.33			36.92	1.18		A
1,2,3,4,6,7,8-HpCDD	58.0			39.93	1.05		
OCDD	651			44.09	0.89		
2,3,7,8-TCDF	1.28			30.22	0.77		
1,2,3,7,8-PeCDF	1.18			33.20	1.62		A
2,3,4,7,8-PeCDF	1.55			33.83	1.64		A
1,2,3,4,7,8-HxCDF	8.34			35.90	1.27		
1,2,3,6,7,8-HxCDF	4.64			35.98	1.29		
2,3,4,6,7,8-HxCDF	3.50			36.46	1.23		A
1,2,3,7,8,9-HxCDF	2.39			37.25	1.38		A
1,2,3,4,6,7,8-HpCDF	79.6			38.70	1.05		
1,2,3,4,7,8,9-HpCDF	10.5			40.59	1.10		
OCDF	222			44.38	0.88		
Total TCDDs	2.52		6.24				
Total PeCDDs	5.09		7.30				
Total HxCDDs	18.2		18.8				
Total HpCDDs	133						
Total TCDFs	10.2		11.5				
Total PeCDFs	10.3		12.5				
Total HxCDFs	42.1		42.5				
Total HpCDFs	140						
WHO-2005 TEQ (ND=0)	5.27		6.20				
WHO-2005 TEQ (ND=½)	5.50		6.20				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB53A		Weight / Volume:	13.17	g
			Solids / Lipids:	83.9	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-19B		Filename:	c26jan07d_2-10	
Collection Date/Time:	01/09/07	10:50	Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	9:59	Initial Cal:	m8290-c110206a	

VALUE CHANGE

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Method 8290
54SB53A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.46	73.0	31.05	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.47	73.3	34.00	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.66	83.1	36.67	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.68	83.9	39.92	1.04	
13C12-OCDD	4.0	2.31	57.8	44.08	0.90	
13C12-2,3,7,8-TCDF	2.0	1.94	96.8	30.21	0.81	
13C12-1,2,3,7,8-PeCDF	2.0	1.63	81.6	33.20	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.71	85.4	35.97	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.71	85.4	38.69	0.47	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.336	83.9	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.333	83.2	33.81	1.66	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.318	79.5	36.58	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.330	82.6	35.87	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.340	84.9	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.20	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB53A		Weight / Volume:	13.17 g
			Solids / Lipids:	83.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-19B		Filename:	c26jan07d_2-10
Collection Date/Time:	01/09/07	10:50	Retchk:	c26jan07d-15
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14
Analysis Date/Time:	01/27/07	9:59	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.12]Report

Analyzed by: HMP
Date: 06Mar07

Reviewed by: [signature]
Date: 3/6/07

Method 8290
54SB77A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	1.34			31.07	0.69		
1,2,3,7,8-PeCDD	ND	0.412					
1,2,3,4,7,8-HxCDD	ND	0.412					
1,2,3,6,7,8-HxCDD	ND	0.412					
1,2,3,7,8,9-HxCDD	ND	0.412					
1,2,3,4,6,7,8-HpCDD	5.76			39.94	1.03		
OCDD	120			44.10	0.88		
2,3,7,8-TCDF	EMPC	0.138	0.390 J1W	30.23	0.89	*	A
1,2,3,7,8-PeCDF	0.135			33.22	1.74		A
2,3,4,7,8-PeCDF	0.193			33.85	1.39		A
1,2,3,4,7,8-HxCDF	EMPC	0.412	0.183 J1W	35.90	1.44	*	A
1,2,3,6,7,8-HxCDF	EMPC	0.412	0.135 J1W	36.00	1.43	*	A
2,3,4,6,7,8-HxCDF	0.147			36.47	1.09		A
1,2,3,7,8,9-HxCDF	ND	0.412					
1,2,3,4,6,7,8-HpCDF	1.19			38.70	1.09		A
1,2,3,4,7,8,9-HpCDF	ND	0.412					
OCDF	2.00			44.39	0.83		A
Total TCDDs	1.34		2.72				
Total PeCDDs	0.655		1.06				
Total HxCDDs	2.41						
Total HpCDDs	19.1						
Total TCDFs	1.23		1.86				
Total PeCDFs	0.897		1.35				
Total HxCDFs	1.14		1.46				
Total HpCDFs	2.30						
WHO-2005 TEQ (ND=0)	1.52		1.59				
WHO-2005 TEQ (ND=½)	1.86		1.88				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB77A		Weight / Volume:	13.78	g
			Solids / Lipids:	88.2	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-20B		Filename:	c26jan07d_2-11	
Collection Date/Time:	01/09/07	15:10	Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	10:47	Initial Cal:	m8290-c110206a	

Method 8290
54SB77A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.14	56.8	31.05	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.22	61.0	34.01	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.32	66.0	36.67	1.23	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.34	66.8	39.92	1.08	
13C12-OCDD	4.0	1.71	42.8	44.08	0.94	
13C12-2,3,7,8-TCDF	2.0	1.48	73.9	30.22	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.29	64.7	33.20	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.37	68.7	35.97	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.40	70.0	38.69	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.255	63.8	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.276	68.9	33.83	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.235	58.8	36.60	1.21	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.284	71.1	35.88	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.276	69.0	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.18	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB77A		Weight / Volume:	13.78 g
			Solids / Lipids:	88.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-20B		Filename:	c26jan07d_2-11
Collection Date/Time:	01/09/07	15:10	Retchk:	c26jan07d-15
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14
Analysis Date/Time:	01/27/07	10:47	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: [signature]
Date: 2/2/07

Method 8290
Dup-2
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0968					
1,2,3,7,8-PeCDD	~~ND EMPC~~	0.484	~~0.0871~~	34.03	0.59	*	A
1,2,3,4,7,8-HxCDD	ND	0.484					
1,2,3,6,7,8-HxCDD	ND	0.484					
1,2,3,7,8,9-HxCDD	~~ND EMPC~~	0.484	~~0.211~~	36.92	1.61	*	A
1,2,3,4,6,7,8-HpCDD	2.06			39.96	0.97		A
OCDD	65.7			44.10	0.91		
2,3,7,8-TCDF	ND 0.327 B7 Z			30.22	0.67		A
1,2,3,7,8-PeCDF	ND ~~EMPC~~	0.484	~~0.0562~~	33.24	0.60	*	A
2,3,4,7,8-PeCDF	ND ~~EMPC~~	0.484	~~0.0523~~	33.84	2.07	*	A
1,2,3,4,7,8-HxCDF	ND	0.484					
1,2,3,6,7,8-HxCDF	ND	0.484					
2,3,4,6,7,8-HxCDF	ND	0.484					
1,2,3,7,8,9-HxCDF	ND	0.484					
1,2,3,4,6,7,8-HpCDF	EMPC	0.484	0.174 J,W	38.71	0.85	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.484					
OCDF	ND	0.968					
Total TCDDs	ND	0.0968					
Total PeCDDs	ND	0.484	0.372				
Total HxCDDs	1.23		1.44				
Total HpCDDs	6.69						
Total TCDFs	0.509 B7 Z		0.616				
Total PeCDFs	ND	0.484	0.108				
Total HxCDFs	ND	0.484					
Total HpCDFs	ND	0.484	0.174				
WHO-2005 TEQ (ND=0)	0.0730		0.200				
WHO-2005 TEQ (ND=½)	0.618		0.397				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	Dup-2		Weight / Volume:	12.14	g
			Solids / Lipids:	85.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-21B		Filename:	c26jan07d_2-12	
Collection Date/Time:	01/09/07		Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	11:36	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
Dup-2
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.51	75.5	31.05	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.48	74.2	34.01	1.60	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.67	83.6	36.67	1.16	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.75	87.5	39.92	1.06	
13C12-OCDD	4.0	2.34	58.4	44.08	0.90	
13C12-2,3,7,8-TCDF	2.0	1.91	95.7	30.21	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.60	80.0	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.71	85.7	35.98	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.72	85.9	38.70	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.335	83.7	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.335	83.8	33.83	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.299	74.7	36.60	1.20	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.359	89.8	35.88	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.356	88.9	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.13	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	Dup-2		Weight / Volume:	12.14 g
			Solids / Lipids:	85.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-21B		Filename:	c26jan07d_2-12
Collection Date/Time:	01/09/07		Retchk:	c26jan07d-15
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14
Analysis Date/Time:	01/27/07	11:36	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: CRL
Date: 2/5/07

Method 8290
54SB43A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	1.05			31.06	0.72		
1,2,3,7,8-PeCDD	~~EMPC~~ ND	0.490	~~3.44~~	34.03	0.70	*	A
1,2,3,4,7,8-HxCDD	3.22			36.61	1.26		A
1,2,3,6,7,8-HxCDD	8.89			36.70	1.26		
1,2,3,7,8,9-HxCDD	8.34			36.93	1.35		
1,2,3,4,6,7,8-HpCDD	210			39.94	1.04		
OCDD	1860			44.11	0.91		
2,3,7,8-TCDF	9.85			30.25	0.78		
1,2,3,7,8-PeCDF	6.49			33.21	1.56		
2,3,4,7,8-PeCDF	7.69			33.84	1.61		
1,2,3,4,7,8-HxCDF	10.7			35.90	1.29		
1,2,3,6,7,8-HxCDF	8.08			35.99	1.28		
2,3,4,6,7,8-HxCDF	8.97			36.49	1.24		
1,2,3,7,8,9-HxCDF	2.51			37.26	1.30		A
1,2,3,4,6,7,8-HpCDF	86.9			38.71	1.05		
1,2,3,4,7,8,9-HpCDF	6.24			40.59	1.00		
OCDF	216			44.39	0.91		
Total TCDDs	11.7		17.6				
Total PeCDDs	23.2		30.0				
Total HxCDDs	71.3						
Total HpCDDs	448						
Total TCDFs	110		117				
Total PeCDFs	60.3		66.9				
Total HxCDFs	101						
Total HpCDFs	241						
WHO-2005 TEQ (ND=0)	13.3		16.7				
WHO-2005 TEQ (ND=½)	13.5		16.7				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB43A		Weight / Volume:	12.51	g
			Solids / Lipids:	81.6	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-22B		Filename:	c26jan07d_2-13	
Collection Date/Time:	01/08/07	14:46	Retchk:	c26jan07d-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14	
Analysis Date/Time:	01/27/07	12:24	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB43A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.43	71.6	31.05	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.47	73.5	34.01	1.64	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.65	82.4	36.69	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.72	85.9	39.93	1.06	
13C12-OCDD	4.0	2.54	63.5	44.09	0.91	
13C12-2,3,7,8-TCDF	2.0	1.89	94.6	30.22	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.59	79.5	33.21	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.67	83.4	35.98	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.71	85.3	38.70	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.316	79.0	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.319	79.7	33.83	1.57	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.269	67.2	36.60	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.331	82.8	35.88	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.332	82.9	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.82	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.26	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB43A		Weight / Volume:	12.51 g
			Solids / Lipids:	81.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-22B		Filename:	c26jan07d_2-13
Collection Date/Time:	01/08/07	14:46	Retchk:	c26jan07d-15
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d-15
Extraction Date:	01/18/07		End ConCal:	c26jan07d_2-14
Analysis Date/Time:	01/27/07	12:24	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02Feb07

Reviewed by: [signature]
Date: 2/1/07

Method 8290
54SB43B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.102					
1,2,3,7,8-PeCDD	0.120			34.00	1.41		A
1,2,3,4,7,8-HxCDD	ND	0.509					
1,2,3,6,7,8-HxCDD	ND	0.509					
1,2,3,7,8,9-HxCDD	ND	0.509					
1,2,3,4,6,7,8-HpCDD	EMPC	0.509	2.20 J1 W	39.93	1.25	*	A
OCDD	120			44.08	0.87		
2,3,7,8-TCDF	ND	0.106					
1,2,3,7,8-PeCDF	EMPC	0.509	0.0713 J1 W	33.22	1.21	*	A
2,3,4,7,8-PeCDF	0.106			33.83	1.45		A
1,2,3,4,7,8-HxCDF	ND	0.509					
1,2,3,6,7,8-HxCDF	ND	0.509					
2,3,4,6,7,8-HxCDF	~~EMPC~~ ND	0.509	~~0.0978~~	36.46	1.71	*	A
1,2,3,7,8,9-HxCDF	ND	0.509					
1,2,3,4,6,7,8-HpCDF	EMPC	0.509	0.216 J1 W	38.70	1.20	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.509					
OCDF	~~EMPC~~ ND	1.02	~~0.112~~	44.36	1.80	*	A
Total TCDDs	ND	0.102	2.66				
Total PeCDDs	0.481		0.637				
Total HxCDDs	0.285		0.741				
Total HpCDDs	5.95		8.14				
Total TCDFs	0.275 B1Z		0.360				
Total PeCDFs	0.106		0.332				
Total HxCDFs	0.0631		0.253				
Total HpCDFs	ND	0.509	0.348				
WHO-2005 TEQ (ND=0)	0.188		0.224				
WHO-2005 TEQ (ND=½)	0.438		0.435				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB43B		Weight / Volume:	11.90	g
			Solids / Lipids:	82.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-23B		Filename:	c26jan07d_3-2	
Collection Date/Time:	01/08/07	14:50	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	14:56	Initial Cal:	m8290-c110206a	

VALUE CHANGE

524

Method 8290
54SB43B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.41	70.3	31.03	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.41	70.5	34.00	1.55	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.54	76.9	36.67	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.53	76.3	39.92	1.07	
13C12-OCDD	4.0	1.96	48.9	44.07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.89	94.3	30.21	0.81	
13C12-1,2,3,7,8-PeCDF	2.0	1.51	75.5	33.20	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.56	78.0	35.97	0.56	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.53	76.7	38.69	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.343	85.7	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.342	85.4	33.81	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.287	71.9	36.58	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.338	84.5	35.87	0.55	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.339	84.6	40.57	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.24	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB43B		Weight / Volume:	11.90	g
			Solids / Lipids:	82.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-23B		Filename:	c26jan07d_3-2	
Collection Date/Time:	01/08/07	14:50	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	14:56	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 05Feb07

Reviewed by: CRL
Date: 2/5/07

Method 8290
54SB43C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	0.405			31.05	0.82		A
1,2,3,7,8-PeCDD	ND ~~EMPC~~	0.477	~~0.359~~	34.01	0.83	*	A
1,2,3,4,7,8-HxCDD	0.489			36.60	1.38		A
1,2,3,6,7,8-HxCDD	1.28			36.69	1.37		A
1,2,3,7,8,9-HxCDD	ND ~~EMPC~~	0.477	~~1.15~~	36.93	1.58	*	A
1,2,3,4,6,7,8-HpCDD	53.8			39.93	1.02		
OCDD	733			44.08	0.89		
2,3,7,8-TCDF	0.900			30.22	0.75		A
1,2,3,7,8-PeCDF	EMPC	0.477	0.537 JW	33.20	1.89	*	A
2,3,4,7,8-PeCDF	EMPC	0.477	0.640 JW	33.84	1.88	*	A
1,2,3,4,7,8-HxCDF	EMPC	0.477	0.974 JW	35.90	1.45	*	A
1,2,3,6,7,8-HxCDF	0.819			35.98	1.25		A
2,3,4,6,7,8-HxCDF	EMPC	0.477	0.745 JW	36.47	1.46	*	A
1,2,3,7,8,9-HxCDF	EMPC	0.477	0.206 JW	37.25	1.49	*	A
1,2,3,4,6,7,8-HpCDF	14.3			38.70	1.07		
1,2,3,4,7,8,9-HpCDF	0.825			40.59	1.00		A
OCDF	64.6			44.37	0.88		
Total TCDDs	0.707		0.909				
Total PeCDDs	1.85		3.54				
Total HxCDDs	8.50		9.92				
Total HpCDDs	127						
Total TCDFs	7.08		8.73				
Total PeCDFs	3.18		5.47				
Total HxCDFs	8.68		10.8				
Total HpCDFs	42.6						
WHO-2005 TEQ (ND=0)	1.68		2.56				
WHO-2005 TEQ (ND=½)	2.10		2.56				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB43C		Weight / Volume:	12.90	g
			Solids / Lipids:	81.2	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-24B		Filename:	c26jan07d_3-3	
Collection Date/Time:	01/08/07	14:55	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	15:44	Initial Cal:	m8290-c110206a	

VALUE CHANGE

550

Method 8290
54SB43C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.44	72.0	31.05	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.41	70.5	34.00	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.60	79.9	36.67	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.64	82.1	39.92	1.10	
13C12-OCDD	4.0	2.34	58.5	44.08	0.89	
13C12-2,3,7,8-TCDF	2.0	1.87	93.7	30.21	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.49	74.7	33.20	1.54	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.64	81.8	35.97	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.64	82.1	38.69	0.47	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.328	82.1	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.333	83.2	33.81	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.276	69.1	36.58	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.337	84.2	35.87	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.339	84.7	40.57	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.32	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB43C		Weight / Volume:	12.90	g
			Solids / Lipids:	81.2	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-24B		Filename:	c26jan07d_3-3	
Collection Date/Time:	01/08/07	14:55	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	15:44	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: JMP
Date: 05Feb07

Reviewed by: CKL
Date: 2/5/07

Method 8290
54SB40A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	0.733			31.06	0.86		A
1,2,3,7,8-PeCDD	~~EMPC~~ ND	0.490	~~0.317~~	34.04	1.14	*	A
1,2,3,4,7,8-HxCDD	0.198			36.60	1.25		A
1,2,3,6,7,8-HxCDD	0.460			36.69	1.20		A
1,2,3,7,8,9-HxCDD	0.453			36.91	1.34		A
1,2,3,4,6,7,8-HpCDD	10.1			39.94	1.05		
OCDD	234 J,i			44.08	0.91		
2,3,7,8-TCDF	0.570 B,i			30.22	0.76		A
1,2,3,7,8-PeCDF	0.231			33.21	1.49		A
2,3,4,7,8-PeCDF	0.474			33.84	1.48		A
1,2,3,4,7,8-HxCDF	0.407			35.90	1.28		A
1,2,3,6,7,8-HxCDF	0.372			35.98	1.16		A
2,3,4,6,7,8-HxCDF	EMPC	0.490	0.646 J,W	36.46	1.48	*	A
1,2,3,7,8,9-HxCDF	ND	0.490					
1,2,3,4,6,7,8-HpCDF	2.88			38.70	1.05		A
1,2,3,4,7,8,9-HpCDF	ND	0.490					
OCDF	6.96 J,i			44.39	0.89		A
Total TCDDs	1.69		2.06				
Total PeCDDs	1.99		3.04				
Total HxCDDs	2.61		4.76				
Total HpCDDs	35.2						
Total TCDFs	3.38		3.80				
Total PeCDFs	2.99		3.35				
Total HxCDFs	2.69		3.88				
Total HpCDFs	6.92		7.22				
WHO-2005 TEQ (ND=0)	1.33		1.71				
WHO-2005 TEQ (ND=½)	1.63		1.74				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB40A		Weight / Volume:	12.36	g
			Solids / Lipids:	82.6	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-25B		Filename:	c26jan07d_3-4	
Collection Date/Time:	01/08/07	15:15	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	16:32	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB40A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.10	54.9	31.05	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.14	56.8	34.01	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.21	60.7	36.67	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.20	60.1	39.92	1.05	
13C12-OCDD	4.0	1.59	39.7 #	44.08	0.86	
13C12-2,3,7,8-TCDF	2.0	1.43	71.5	30.21	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.21	60.7	33.20	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.22	61.0	35.97	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.22	61.2	38.69	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.249	62.3	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.263	65.7	33.83	1.63	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.196	48.9	36.60	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.241	60.1	35.87	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.251	62.9	40.57	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.24	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB40A		Weight / Volume:	12.36 g
			Solids / Lipids:	82.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-25B		Filename:	c26jan07d_3-4
Collection Date/Time:	01/08/07	15:15	Retchk:	c26jan07d_2-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14
Extraction Date:	01/18/07		End ConCal:	c26jan07d_3-14
Analysis Date/Time:	01/27/07	16:32	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: JW
Date: 02-05-07

Reviewed by: QW
Date: 2/15/07

Method 8290
54SB40B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0824					
1,2,3,7,8-PeCDD	~~EMPC~~ ND	0.412	~~0.112~~	34.03	0.84	*	A
1,2,3,4,7,8-HxCDD	~~EMPC~~ ND	0.412	~~0.0528~~	36.60	0.63	*	A
1,2,3,6,7,8-HxCDD	EMPC	0.412	0.234 J,W	36.69	1.47	*	A
1,2,3,7,8,9-HxCDD	EMPC	0.412	0.221 J,W	36.93	1.05	*	A
1,2,3,4,6,7,8-HpCDD	3.41			39.94	1.00		A
OCDD	164			44.09	0.91		
2,3,7,8-TCDF	0.265 B,Z			30.25	0.87		A
1,2,3,7,8-PeCDF	0.0874			33.22	1.38		A
2,3,4,7,8-PeCDF	0.153			33.83	1.63		A
1,2,3,4,7,8-HxCDF	EMPC	0.412	0.114 J,W	35.91	0.95	*	A
1,2,3,6,7,8-HxCDF	0.120			35.99	1.22		A
2,3,4,6,7,8-HxCDF	0.223			36.48	1.17		A
1,2,3,7,8,9-HxCDF	ND	0.412					
1,2,3,4,6,7,8-HpCDF	0.394			38.71	0.95		A
1,2,3,4,7,8,9-HpCDF	ND	0.412					
OCDF	EMPC	0.824	0.341 J,W	44.40	1.03	*	A
Total TCDDs	0.204						
Total PeCDDs	1.48		1.86				
Total HxCDDs	1.07		2.17				
Total HpCDDs	12.6						
Total TCDFs	1.12 B,Z		1.99				
Total PeCDFs	0.745		1.26				
Total HxCDFs	0.610		0.961				
Total HpCDFs	0.394		0.557				
WHO-2005 TEQ (ND=0)	0.197		0.371				
WHO-2005 TEQ (ND=½)	0.549		0.435				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB40B		Weight / Volume:	14.91	g
			Solids / Lipids:	81.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-26B		Filename:	c26jan07d_3-5	
Collection Date/Time:	01/08/07	15:25	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	17:21	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB40B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.50	75.0	31.06	0.83	
13C12-1,2,3,7,8-PeCDD	2.0	1.50	75.1	34.01	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.67	83.6	36.69	1.29	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.70	84.8	39.92	1.05	
13C12-OCDD	4.0	2.20	55.1	44.08	0.90	
13C12-2,3,7,8-TCDF	2.0	1.98	99.0	30.22	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.60	80.1	33.21	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.68	84.0	35.98	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.72	86.1	38.70	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.334	83.5	31.07	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.336	84.0	33.83	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.290	72.5	36.60	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.344	85.9	35.88	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.345	86.3	40.57	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.82	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.34	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB40B		Weight / Volume:	14.91 g
			Solids / Lipids:	81.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14074
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-26B		Filename:	c26jan07d_3-5
Collection Date/Time:	01/08/07	15:25	Retchk:	c26jan07d_2-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14
Extraction Date:	01/18/07		End ConCal:	c26jan07d_3-14
Analysis Date/Time:	01/27/07	17:21	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: JWO
Date: 02-05-07

Reviewed by: [illegible]
Date: 2/5/07

Method 8290
54SB40C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0869					
1,2,3,7,8-PeCDD	ND	0.435					
1,2,3,4,7,8-HxCDD	ND	0.435					
1,2,3,6,7,8-HxCDD	ND	0.435					
1,2,3,7,8,9-HxCDD	ND	0.435					
1,2,3,4,6,7,8-HpCDD	0.786			39.94	1.00		A
OCDD	24.6			44.10	0.91		
2,3,7,8-TCDF	ND	0.0869					
1,2,3,7,8-PeCDF	ND	0.435					
2,3,4,7,8-PeCDF	ND	0.435					
1,2,3,4,7,8-HxCDF	ND	0.435					
1,2,3,6,7,8-HxCDF	ND	0.435					
2,3,4,6,7,8-HxCDF	ND	0.435					
1,2,3,7,8,9-HxCDF	ND	0.435					
1,2,3,4,6,7,8-HpCDF	EMPC	0.435	0.165 JW	38.70	0.85	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.435					
OCDF	0.0643			44.37	0.77		A
Total TCDDs	ND	0.0869					
Total PeCDDs	ND	0.435					
Total HxCDDs	ND	0.435	0.176				
Total HpCDDs	0.786		2.71				
Total TCDFs	ND	0.0869	0.263				
Total PeCDFs	ND	0.435					
Total HxCDFs	ND	0.435	0.0504				
Total HpCDFs	ND	0.435	0.165				
WHO-2005 TEQ (ND=0)	0.0153		0.0169				
WHO-2005 TEQ (ND=½)	0.509		0.508				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB40C		Weight / Volume:	14.09	g
			Solids / Lipids:	81.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-27B		Filename:	c26jan07d_3-6	
Collection Date/Time:	01/08/07	15:30	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	18:09	Initial Cal:	m8290-c110206a	

Method 8290
54SB40C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.42	71.2	31.05	0.84	
13C12-1,2,3,7,8-PeCDD	2.0	1.48	73.8	34.01	1.65	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.53	76.5	36.69	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.49	74.7	39.93	1.07	
13C12-OCDD	4.0	1.99	49.7	44.08	0.94	
13C12-2,3,7,8-TCDF	2.0	1.87	93.4	30.22	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.54	77.1	33.21	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.54	77.0	35.98	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.50	74.9	38.70	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.331	82.9	31.07	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.340	85.0	33.83	1.64	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.261	65.3	36.60	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.317	79.3	35.88	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.320	80.0	40.58	0.47	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.25	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB40C		Weight / Volume:	14.09 g	
			Solids / Lipids:	81.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-27B		Filename:	c26jan07d_3-6	
Collection Date/Time:	01/08/07	15:30	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/18/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	18:09	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02-05-07

Reviewed by: MLT
Date: 2/5/07

Method 8290
54SB39A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	1.19				
1,2,3,7,8-PeCDD	ND	5.96				
1,2,3,4,7,8-HxCDD	ND	5.96				
1,2,3,6,7,8-HxCDD	ND	5.96				
1,2,3,7,8,9-HxCDD	ND	5.96				
1,2,3,4,6,7,8-HpCDD	4.01			39.92	0.98	A
OCDD	68.4			44.09	0.83	A
2,3,7,8-TCDF	6.10			30.21	0.80	A
1,2,3,7,8-PeCDF	1.05			33.21	1.71	A
2,3,4,7,8-PeCDF	0.858			33.83	1.42	A
1,2,3,4,7,8-HxCDF	ND	5.96				
1,2,3,6,7,8-HxCDF	ND	5.96				
2,3,4,6,7,8-HxCDF	ND	5.96				
1,2,3,7,8,9-HxCDF	ND	5.96				
1,2,3,4,6,7,8-HpCDF	ND	5.96				
1,2,3,4,7,8,9-HpCDF	ND	5.96				
OCDF	ND	11.9				
Total TCDDs	ND	1.19	2.07			
Total PeCDDs	ND	5.96				
Total HxCDDs	ND	5.96				
Total HpCDDs	4.01					
Total TCDFs	9.63					
Total PeCDFs	2.46					
Total HxCDFs	0.691					
Total HpCDFs	ND	5.96				
WHO-2005 TEQ (ND=0)	0.960		0.960			
WHO-2005 TEQ (ND=½)	6.68		6.68			

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB39A		Weight / Volume:	1.01	g
			Solids / Lipids:	83.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-28C		Filename:	c26jan07d_3-7	
Collection Date/Time:	01/08/07	15:35	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	18:57	Initial Cal:	m8290-c110206a	

Method 8290
54SB39A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.44	71.9	31.03	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.50	75.0	34.00	1.61	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.53	76.6	36.67	1.22	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.59	79.7	39.91	1.07	
13C12-OCDD	4.0	2.37	59.1	44.08	0.91	
13C12-2,3,7,8-TCDF	2.0	1.92	96.0	30.19	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.65	82.5	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.60	79.8	35.97	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.59	79.7	38.69	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.312	78.1	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.316	79.1	33.81	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.265	66.2	36.58	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.304	76.0	35.87	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.312	78.1	40.56	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.42	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.26	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB39A		Weight / Volume:	1.01 g	
			Solids / Lipids:	83.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-28C		Filename:	c26jan07d_3-7	
Collection Date/Time:	01/08/07	15:35	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	18:57	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 05Feb07

Reviewed by: CRL
Date: 2/5/07

Method 8290
54SB39B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	~~EMPC~~ ND	1.02	~~0.451~~	31.02	0.56	*	A
1,2,3,7,8-PeCDD	ND	5.12					
1,2,3,4,7,8-HxCDD	ND	5.12					
1,2,3,6,7,8-HxCDD	ND	5.12					
1,2,3,7,8,9-HxCDD	ND	5.12					
1,2,3,4,6,7,8-HpCDD	ND	5.12					
OCDD	116			44.08	0.94		
2,3,7,8-TCDF	5.18			30.23	0.73		A
1,2,3,7,8-PeCDF	~~EMPC~~ ND	5.12	~~0.901~~	33.20	2.02	*	A
2,3,4,7,8-PeCDF	1.11			33.83	1.74		A
1,2,3,4,7,8-HxCDF	ND	5.12					
1,2,3,6,7,8-HxCDF	ND	5.12					
2,3,4,6,7,8-HxCDF	ND	5.12					
1,2,3,7,8,9-HxCDF	ND	5.12					
1,2,3,4,6,7,8-HpCDF	EMPC	5.12	0.614 JW	38.70	0.87	*	A
1,2,3,4,7,8,9-HpCDF	ND	5.12					
OCDF	ND	10.2					
Total TCDDs	ND	1.02	0.451				
Total PeCDDs	ND	5.12	1.23				
Total HxCDDs	ND	5.12					
Total HpCDDs	6.96						
Total TCDFs	8.15						
Total PeCDFs	1.76		2.66				
Total HxCDFs	ND	5.12					
Total HpCDFs	0.655		1.27				
WHO-2005 TEQ (ND=0)	0.886		1.37				
WHO-2005 TEQ (ND=½)	5.90		5.77				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB39B		Weight / Volume:	1.06	g
			Solids / Lipids:	92.1	%
			Original pH:	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-29C		Filename:	c26jan07d_3-8	
Collection Date/Time:	01/08/07	15:40	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	19:46	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB39B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.49	74.5	31.03	0.84	
13C12-1,2,3,7,8-PeCDD	2.0	1.48	74.2	34.00	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.76	87.9	36.67	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.69	84.5	39.92	1.06	
13C12-OCDD	4.0	2.64	65.9	44.08	0.89	
13C12-2,3,7,8-TCDF	2.0	1.97	98.5	30.21	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.67	83.5	33.20	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.55	77.6	35.97	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.68	84.1	38.69	0.47	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.323	80.7	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.333	83.3	33.81	1.66	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.266	66.5	36.58	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.310	77.6	35.87	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.333	83.4	40.57	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.42	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.23	

Client Information			**Sample Information**	
Project Name:	TWNU54		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB39B		Weight / Volume:	1.06 g
			Solids / Lipids:	92.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:	G296-346		Instrument:	HRMS3
Sample ID:	G296-346-29C		Filename:	c26jan07d_3-8
Collection Date/Time:	01/08/07	15:40	Retchk:	c26jan07d_2-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14
Extraction Date:	01/24/07		End ConCal:	c26jan07d_3-14
Analysis Date/Time:	01/27/07	19:46	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 05Feb07

Reviewed by: CM
Date: 2/5/07

Method 8290
54SB39C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	1.11					
1,2,3,7,8-PeCDD	ND	5.56					
1,2,3,4,7,8-HxCDD	ND	5.56					
1,2,3,6,7,8-HxCDD	ND	5.56					
1,2,3,7,8,9-HxCDD	ND	5.56					
1,2,3,4,6,7,8-HpCDD	4.56			39.94	1.09		A
OCDD	55.7			44.09	0.87		A
2,3,7,8-TCDF	6.10			30.23	0.77		A
1,2,3,7,8-PeCDF	1.09			33.21	1.46		A
2,3,4,7,8-PeCDF	1.09			33.84	1.61		A
1,2,3,4,7,8-HxCDF	ND	5.56					
1,2,3,6,7,8-HxCDF	ND ~~EMPC~~	5.56	~~1.22~~	35.98	1.56	*	A
2,3,4,6,7,8-HxCDF	ND	5.56					
1,2,3,7,8,9-HxCDF	ND	5.56					
1,2,3,4,6,7,8-HpCDF	ND	5.56					
1,2,3,4,7,8,9-HpCDF	ND	5.56					
OCDF	ND	11.1					
Total TCDDs	ND	1.11					
Total PeCDDs	1.11		2.69				
Total HxCDDs	2.54						
Total HpCDDs	12.4						
Total TCDFs	9.48		10.1				
Total PeCDFs	2.43		3.18				
Total HxCDFs	ND	5.56	1.22				
Total HpCDFs	ND	5.56	0.646				
WHO-2005 TEQ (ND=0)	1.03		1.15				
WHO-2005 TEQ (ND=½)	6.38		6.22				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB39C		Weight / Volume:	1.07	g
			Solids / Lipids:	84.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-30C		Filename:	c26jan07d_3-9	
Collection Date/Time:	01/08/07	15:45	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	20:34	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB39C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.46	72.8	31.05	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.49	74.4	34.01	1.54	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.59	79.4	36.67	1.22	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.65	82.6	39.92	1.09	
13C12-OCDD	4.0	2.46	61.6	44.08	0.93	
13C12-2,3,7,8-TCDF	2.0	1.90	95.1	30.21	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.59	79.6	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.65	82.4	35.98	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.69	84.3	38.69	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.319	79.7	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.314	78.4	33.83	1.57	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.286	71.4	36.60	1.23	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.332	83.1	35.88	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.333	83.4	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.31	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB39C		Weight / Volume:	1.07	g
			Solids / Lipids:	84.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-30C		Filename:	c26jan07d_3-9	
Collection Date/Time:	01/08/07	15:45	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	20:34	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: JW
Date: 02-05-07

Reviewed by:
Date: 2/5/07

Method 8290
54SB42A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	1.08					
1,2,3,7,8-PeCDD	~~EMPC~~ ND	5.39	~~0.841~~	34.03	0.81	*	A
1,2,3,4,7,8-HxCDD	ND	5.39					
1,2,3,6,7,8-HxCDD	1.70			36.70	1.13		A
1,2,3,7,8,9-HxCDD	ND	5.39					
1,2,3,4,6,7,8-HpCDD	60.7			39.93	1.06		
OCDD	3630			44.09	0.90		
2,3,7,8-TCDF	5.91 JF			30.23	0.87		A
1,2,3,7,8-PeCDF	~~EMPC~~ ND	5.39	~~1.57~~	33.22	1.97	*	A
2,3,4,7,8-PeCDF	1.64			33.84	1.39		A
1,2,3,4,7,8-HxCDF	1.96			35.90	1.06		A
1,2,3,6,7,8-HxCDF	1.12			35.98	1.36		A
2,3,4,6,7,8-HxCDF	EMPC	5.39	0.733 JW	36.47	1.45	*	A
1,2,3,7,8,9-HxCDF	ND	5.39					
1,2,3,4,6,7,8-HpCDF	9.46			38.71	1.02		A
1,2,3,4,7,8,9-HpCDF	ND	5.39					
OCDF	20.5			44.40	0.90		A
Total TCDDs	ND	1.08	3.73				
Total PeCDDs	1.51		4.63				
Total HxCDDs	13.1						
Total HpCDDs	214						
Total TCDFs	9.31		10.8				
Total PeCDFs	4.05		8.84				
Total HxCDFs	11.1		11.9				
Total HpCDFs	27.6						
WHO-2005 TEQ (ND=0)	3.36		4.32				
WHO-2005 TEQ (ND=½)	7.78		5.69				

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB42A		Weight / Volume:	1.12	g
			Solids / Lipids:	82.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-31C		Filename:	c26jan07d_3-10	
Collection Date/Time:	01/08/07	16:00	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	21:22	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
54SB42A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.53	76.5	31.05	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.48	74.0	34.01	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.64	82.2	36.67	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.75	87.6	39.92	1.10	
13C12-OCDD	4.0	2.89	72.2	44.08	0.92	
13C12-2,3,7,8-TCDF	2.0	1.95	97.3	30.22	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.58	79.0	33.20	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.61	80.5	35.98	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.76	87.9	38.69	0.47	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.330	82.4	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.315	78.7	33.83	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.241	60.2	36.60	1.22	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.291	72.8	35.88	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.341	85.1	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.23	

Client Information			**Sample Information**		
Project Name:	TWNU54		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB42A		Weight / Volume:	1.12	g
			Solids / Lipids:	82.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-346		Instrument:	HRMS3	
Sample ID:	G296-346-31C		Filename:	c26jan07d_3-10	
Collection Date/Time:	01/08/07	16:00	Retchk:	c26jan07d_2-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_3-14	
Analysis Date/Time:	01/27/07	21:22	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: JW
Date: 02.05.07

Reviewed by: CPD
Date: 2/5/07

SGS

Case Narrative
SGS Project: **G296-346**
Project Name: **TWNU 54**

For Methods: 8290 & 1668A

- The submitted samples were accepted into the lab on January 10th, 2007 and extracted between January 11th and January 29th, 2007 by method 3520C. The sample extracts and associated QC extracts were then processed through clean-up by method 3630/3620 and analyzed by HRGC/HRMS for methods 8290 and 1668A.
- Sample **54SB40A** (Dioxin) has a recovery for $^{13}C_{12}$-OCDD which is below the QC limits established by the method. The data is validated based on a favorable EDL and signal-to-noise ratio.
- The OPR associated with workgroup WG14070 (PCB) has recoveries for ^{13}C-4-DiCB and ^{13}C-19-TrCB which are below the method's QC limits. The data is validated based on a favorable signal-to-noise ratio.
- Samples **54SB46A** and **54SB46C** (PCB) required 10X dilutions in order to improve the quality of the data for many of the target analytes due to interferences. The dilution factor is notated on the form 1's.
- Samples **54SB46A** and **54SB46C** (PCB) have several extraction standards with ion ratios falling outside of the QC limits established by the method. This is most likely attributed to the lower signal-to-noise ratios caused by the sample dilutions. Additionally, sample **54SB46A** has recoveries for ^{13}C-4-DiCB and ^{13}C-178-HpCB which fall below the method's QC limits.

Craig R. Tronzo 2/7/07

Craig R. Tronzo — Date
Data Validation/QA Officer

Secondary Review

W. Mike Larkins — Date
Technical Director

Or

Heather Patterson 07Feb07

Heather Patterson — Date
Director

SGS

List of Qualifiers

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* See case narrative

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation generally results in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP+
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
+ Massachusetts Department of Environmental Protection

DATA VALIDATION WORKSHEET
PCB Congeners

Reviewer: RA
Date: 3/24/07
DV Level: II (III) IV
Review Document:
X SW-846 X Project QAPP/SAP
X NFG Region III Draft Guidance (April 2004)

Project Name: SWMU54
Project Number: 116056351
Laboratory: SGS
SDG No.: G296-346
Method No.: 1668A

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 2-3 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Recommended holding time in the Method is one year. If yes, J(+)/UJ(-). No holding time or preservation requirements are promulgated by EPA for non-water matrices), use professional judgement.		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B".	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.		✓	

Notes: *If there are no field blanks, the narrative should include acaution to the user that field blanks were not available for review and any contamination due to field conditions or cross contamination could not be assessed.*

The MB displayed several pos. detections. All sample results were >5X, No action

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/ ± 20% for analytes analyzed by isotope dilution or +/- 35% for analytes analyzed by internal std method? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
7	~~M+2/M+4~~	1.05	0.89 1.21
8	~~M+2/M+4~~	0.89	0.76 1.02
9	~~M+2/M+4~~	~~0.77~~	~~0.65~~ ~~0.89~~
~~10~~	~~M+2/M+4~~	~~0.69~~	~~0.59~~ ~~0.79~~

Notes:

5.0 GC/MS Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start ~~of a 12 hour~~ and end of each analytical sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 330.9792? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Are all IPR, OPR and VER standards within the method QC limits? Results for analytes that do not meet either IPR or OPR requirements should be flagged "J"/"UJ". If analyte is not recovered for an OPR sample, results must be flagged "R" for that analyte.	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

OPR/OPRD was performed ✓

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS recovery form present?			
7.2	Was an LCS analyzed for each batch?			
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?			
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards

		Yes	No	NA
8.1	Are internal standard recoveries for all samples within the method QC limits?If no, apply J/UJ to associated targets.		✓	
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.		✓	

Notes: Sample 545B46A extraction std. 13C-4-DiCB at 23.3% <25-150%. the associated compd 8-DiCB was pos → J,i (cleanup std 13C-178-HpCB at 26.6% < 30-139%.) this is a cleanup std, so no compds are quantified from it. No more action.
Sample 545B46A several ex-stds had signal to noise <10 see below:

13C-19-TrCB at 6%.
13C-37-TrCB at 6%.
13C-189-HpCB at 7%.
13C-205-OcCB at 5%.
13C-208-NoCB at 4%.
13C-206-NoCB at 4%.

and sample results were positive → J,n
* also a couple out in OPR and OPRD, No action since these are QC samples.

9.0 Field Duplicate		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.		✓	
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.	✓		
10.4	Is the signal to noise ≥ 3 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥3 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.7	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.	✓		

Notes: Several compds exceeded calib 9E4 by the lab → J(+) unless prev. flagged for other anomalies.
Note: DLs raised in both samples due to dilutions.

11.0 Ion abundance criteria and EMPC		Yes	No	NA
	For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.			
	For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).			

Notes: Sample 545846 displayed one EMPC, 81-TeCB with an ion ratio within the expanded Region III limit → J, UJ

and one EMPC 169-HxCB outside 25%. → Changed to ND

12.0 Data Completeness		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)			
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported: 0			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Results for Selected PCB Congeners by Method 1668A

Client Sample ID
Lab Method Blank

Laboratory Information			**Sample Information**		
Lab Project ID:			Matrix:	Soil	
Lab Sample ID:	LMB14070		Amount:	10.0	g
Dilution factor:	1		pH:	NA	
Collection Date/Time:			Solids/Basis:	100	/ Dry
Receipt Date/Time:			QC Batch ID:	WG14070/14057	
Extraction Date:	16-Jan-07		Filename:	b19jan07a-5	
Analysis Date/Time:	19-Jan-07	12:14	ConCal:	b19jan07a-1	
			RRT Std:	b19jan07a-2	
			Initial Cal:	m1668a-b010906d	

Analyte (Congener#)	Amount (pg/g)	EDL (pg/g)	RL (pg/g)	RT	Ratio	#	Qualifier
8-DiCB	3.08	0.413	4.00	10:30	1.51		J
18,30-TrCB	1.79	0.489	2.00	12:12	1.15		J
31-TrCB	4.42	0.422	3.73	15:30	1.00		
20,28-TrCB	5.82	0.390	5.48	15:46	1.11		
37-TrCB	2.11	0.375	2.46	20:02	1.05		J
52-TeCB	4.22	0.316	5.35	17:36	0.73		J
49,69-TeCB	1.69	0.265	2.00	18:07	0.64	#	J K
44,47,65-TeCB	2.92	0.293	4.41	18:41	0.85		J
61,70,74,76-TeCB	3.02	0.238	10.5	23:02	0.89	#	J K
66-TeCB	ND	0.247	4.86				U
56-TeCB	ND	0.248	3.04				U
60-TeCB	ND	0.236	2.70				U
81-TeCB	ND	0.243	2.00				U
77-TeCB	ND	0.239	1.22				U
95-PeCB	2.95	0.576	4.60	21:58	1.69		J
90,101,113-PeCB	2.56	0.512	4.38	25:32	1.38		J
99-PeCB	1.26	0.460	4.21	26:17	1.70		J
86,87,97,108,119,125-PeCB	3.23	0.500	6.00	27:01	1.86	#	J K
123-PeCB	ND	0.390	3.21				U
118-PeCB	1.52	0.379	3.07	32:15	1.26	#	J K
114-PeCB	ND	0.385	1.69				U
105-PeCB	0.654	0.421	2.06	33:57	1.55		J
126-PeCB	ND	0.467	1.67				U
135,151-HxCB	ND	0.571	2.00				U
132-HxCB	0.458	0.912	2.07	32:25	0.64	#	J K
146-HxCB	ND	0.793	2.22				U
153,168-HxCB	ND	0.693	3.29				U
129,138,163-HxCB	1.71	0.809	3.00	36:44	1.73	#	J K
158-HxCB	ND	0.575	2.14				U
128,166-HxCB	ND	0.777	2.52				U
167-HxCB	ND	0.314	1.66				U
156,157-HxCB	ND	0.404	2.00				U
169-HxCB	ND	0.354	1.43				U
187-HpCB	ND	0.615	1.33				U
183,185-HpCB	ND	1.35	3.31				U
177-HpCB	ND	1.47	2.55				U
180,193-HpCB	ND	1.21	4.57				U
170-HpCB	ND	1.49	2.50				U
189-HpCB	ND	0.379	1.00				U

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Results for Selected PCB Congeners by Method 1668A

Client Sample ID
Lab Method Blank

Analyte (Congener#)	Amount (pg/g)	EDL (pg/g)	RL (pg/g)	RT #	Ratio #	Qualifier
201-OcCB	ND	0.482	1.70			U
196-OcCB	ND	0.597	1.00			U
203-OcCB	ND	0.538	2.26			U
195-OcCB	ND	1.52	1.89			U
194-OcCB	ND	1.48	2.89			U
206-NoCB	ND	0.846	1.58			U
209-DeCB	ND	0.719	1.66			U

Recovery Information

Labeled Standard	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards			(25-150%)			
13C-4-DiCB	2.00	0.705	35.3	8:26	1.73	
13C-15-DiCB	2.00	1.08	54.1	13:01	1.62	
13C-19-TrCB	2.00	0.910	45.5	10:42	1.10	
13C-37-TrCB	2.00	1.20	60.0	20:01	1.04	
13C-54-TeCB	2.00	1.01	50.5	13:16	0.80	
13C-81-TeCB	2.00	1.03	51.4	28:20	0.77	
13C-77-TeCB	2.00	1.04	52.0	29:06	0.78	
13C-104-PeCB	2.00	1.22	60.8	18:34	1.62	
13C-123-PeCB	2.00	1.18	59.2	31:46	1.61	
13C-118-PeCB	2.00	1.11	55.3	32:13	1.63	
13C-114-PeCB	2.00	1.08	53.9	32:58	1.60	
13C-105-PeCB	2.00	1.09	54.3	33:55	1.56	
13C-126-PeCB	2.00	1.14	57.2	38:28	1.60	
13C-155-HxCB	2.00	1.15	57.7	25:10	1.24	
13C-167-HxCB	2.00	1.06	53.0	41:12	1.31	
13C-156,157-HxCB	4.00	2.16	53.9	42:58	1.30	
13C-169-HxCB	2.00	1.13	56.7	48:03	1.31	
13C-188-HpCB	2.00	1.09	54.3	32:52	1.06	
13C-189-HpCB	2.00	1.18	59.0	51:57	1.10	
13C-202-OcCB	2.00	0.930	46.5	40:46	0.95	
13C-205-OcCB	2.00	1.08	54.2	56:02	0.94	
13C-208-NoCB	2.00	1.06	53.1	51:06	0.79	
13C-206-NoCB	2.00	1.02	50.9	58:47	0.77	
13C-209-DeCB	2.00	0.905	45.2	61:19	1.28	
Cleanup Standards			(30-135%)			
13C-28-TrCB	2.00	1.09	54.5	15:45	1.14	
13C-111-PeCB	2.00	1.13	56.4	29:03	1.61	
13C-178-HpCB	2.00	1.07	53.5	37:20	1.07	
Injection Standards						
13C-9-DiCB	2.00			9:50	1.62	
13C-52-TeCB	2.00			17:35	0.76	
13C-101-PeCB	2.00			25:31	1.61	
13C-138-HxCB	2.00			36:41	1.29	
13C-194-OcCB	2.00			55:16	0.92	

Analyzed By: JF
Date: 02/09/07

Reviewed By: [illegible]
Date: 2/9/07

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On-going Precision and Recovery Results for PCB Congeners by Method 1668A

Client Sample ID
OPR14070

Laboratory Information			**Sample Information**		
Lab Project ID:			Matrix:	Soil	
Lab Sample ID:	OPR14070		Amount:	10.0	g
Dilution factor:	1		pH:	NA	
Collection Date/Time:			Solids/Basis:	100	/ Dry
Receipt Date/Time:			QC Batch ID:	WG14070\14057	
Extraction Date/Time:	16-Jan-07		Filename:	b19jan07a-3	
Analysis Date/Time:	19-Jan-07	10:02	ConCal:	b19jan07a-1	
			RRT Std:	b19jan07a-2	
			Initial Cal:	m1668a-b010906d	

Analyte (IUPAC#)	Spiked (pg/g)	Percent Recovery (50-150%)	RT #	Ratio #	Qualifier
4-DiCB	50.0	128	8:26	1.64	
15-DiCB	50.0	120	13:01	1.64	
19-TrCB	50.0	109	10:42	1.08	
37-TrCB	50.0	102	19:59	1.08	
54-TeCB	100	100	13:16	0.84	
77-TeCB	100	78.8	29:06	0.79	
81-TeCB	100	86.7	28:19	0.80	
104-PeCB	100	102	18:34	1.62	
105-PeCB	100	95.3	33:56	1.55	
114-PeCB	100	98.4	32:59	1.61	
118-PeCB	100	93.1	32:14	1.69	
123-PeCB	100	95.3	31:47	1.46	
126-PeCB	100	85.7	38:29	1.60	
155-HxCB	100	103	25:11	1.29	
156,157-HxCB	200	96.2	42:59	1.27	
167-HxCB	100	100	41:13	1.35	
169-HxCB	100	93.6	48:03	1.34	
188-HpCB	100	106	32:53	1.07	
189-HpCB	100	93.3	51:58	1.08	
202-OcCB	150	97.8	40:46	0.91	
205-OcCB	150	101	56:02	0.89	
206-NoCB	150	95.3	58:48	0.78	
208-NoCB	150	105	51:07	0.80	
209-DeCB	150	104	61:20	1.21	

OKV

On-going Precision and Recovery Results for PCB Congeners by Method 1668A

Client Sample ID
OPR14070

Recovery Information

Labeled Standard	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards						
			(30-140%)			
13C-4-DiCB	2.00	0.202	10.1 #	8:25	1.73	
13C-15-DiCB	2.00	0.634	31.7	13:00	1.59	
13C-19-TrCB	2.00	0.397	19.9 #	10:42	1.03	
13C-37-TrCB	2.00	1.08	54.0	19:58	1.05	
13C-54-TeCB	2.00	0.613	30.6	13:15	0.83	
13C-81-TeCB	2.00	0.995	49.7	28:18	0.77	
13C-77-TeCB	2.00	0.993	49.7	29:05	0.77	
13C-104-PeCB	2.00	0.935	46.8	18:33	1.54	
13C-123-PeCB	2.00	1.03	51.7	31:45	1.65	
13C-118-PeCB	2.00	0.955	47.8	32:12	1.66	
13C-114-PeCB	2.00	0.940	47.0	32:57	1.64	
13C-105-PeCB	2.00	1.01	50.3	33:54	1.61	
13C-126-PeCB	2.00	1.11	55.4	38:27	1.60	
13C-155-HxCB	2.00	1.12	55.8	25:08	1.22	
13C-167-HxCB	2.00	1.13	56.7	41:11	1.28	
13C-156,157-HxCB	4.00	2.16	54.0	42:57	1.26	
13C-169-HxCB	2.00	1.16	58.1	48:01	1.27	
13C-188-HpCB	2.00	1.06	53.1	32:51	1.09	
13C-189-HpCB	2.00	1.20	59.8	51:55	1.10	
13C-202-OcCB	2.00	0.938	46.9	40:44	0.93	
13C-205-OcCB	2.00	1.10	55.2	56:00	0.94	
13C-208-NoCB	2.00	1.04	52.2	51:04	0.78	
13C-206-NoCB	2.00	1.03	51.4	58:46	0.84	
13C-209-DeCB	2.00	0.916	45.8	61:18	1.14	
Cleanup Standards			(40-125%)			
13C-28-TrCB	2.00	0.984	49.2	15:44	1.06	
13C-111-PeCB	2.00	1.03	51.3	29:01	1.65	
13C-178-HpCB	2.00	1.06	53.2	37:18	1.04	
Injection Standards						
13C-9-DiCB	2.00			9:49	1.58	
13C-52-TeCB	2.00			17:33	0.79	
13C-101-PeCB	2.00			25:29	1.56	
13C-138-HxCB	2.00			36:39	1.28	
13C-194-OcCB	2.00			55:15	0.93	

QC sample
No action
required -

Analyzed By: HMP

Date: 07Feb07

Reviewed By: [illegible]

Date: 2/7/07

On-going Precision and Recovery Duplicate Results for PCB Congeners by Method 1668A

Client Sample ID
OPRD14070

Laboratory Information			**Sample Information**		
Lab Project ID:			Matrix:	Soil	
Lab Sample ID:	OPRD14070		Amount:	10.0	g
Dilution factor:	1		pH:	NA	
Collection Date/Time:			Solids/Basis:	100	/ Dry
Receipt Date/Time:			QC Batch ID:	WG14070\14057	
Extraction Date/Time:	16-Jan-07		Filename:	b19jan07a-4	
Analysis Date/Time:	19-Jan-07	11:08	ConCal:	b19jan07a-1	
			RRT Std:	b19jan07a-2	
			Initial Cal:	m1668a-b010906d	

Analyte (IUPAC#)	Spiked (pg/g)	Percent Recovery (50-150%)	RT #	Ratio #	OPR Recovery (50-150%) #	RPD (25%) #	Qualifier
4-DiCB	50.0	137	8:25	1.55	128	6.48	
15-DiCB	50.0	125	13:01	1.66	120	3.75	
19-TrCB	50.0	113	10:42	1.09	109	3.17	
37-TrCB	50.0	108	20:00	1.10	102	5.18	
54-TeCB	100	102	13:16	0.82	100	2.22	
77-TeCB	100	83.6	29:06	0.80	78.8	5.76	
81-TeCB	100	90.5	28:20	0.81	86.7	4.24	
104-PeCB	100	110	18:35	1.56	102	6.89	
105-PeCB	100	103	33:56	1.53	95.3	7.07	
114-PeCB	100	106	32:59	1.58	98.4	6.78	
118-PeCB	100	104	32:14	1.59	93.1	10.3	
123-PeCB	100	102	31:47	1.75	95.3	6.14	
126-PeCB	100	89.9	38:29	1.55	85.7	4.67	
155-HxCB	100	102	25:11	1.24	103	0.602	
156,157-HxCB	200	98.1	43:00	1.26	96.2	1.97	
167-HxCB	100	98.7	41:13	1.19	100	1.33	
169-HxCB	100	95.5	48:04	1.26	93.6	2.00	
188-HpCB	100	108	32:54	1.07	106	1.78	
189-HpCB	100	95.6	51:59	1.04	93.3	2.38	
202-OcCB	150	98.2	40:47	0.93	97.8	0.421	
205-OcCB	150	103	56:03	0.92	101	1.80	
206-NoCB	150	98.0	58:49	0.77	95.3	2.76	
208-NoCB	150	105	51:07	0.81	105	0.357	
209-DeCB	150	107	61:20	1.16	104	2.38	

On-going Precision and Recovery Duplicate Results for PCB Congeners by Method 1668A

Client Sample ID
OPRD14070

Recovery Information

Labeled Standard	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards			(30-140%)			QC Sample No action required
13C-4-DiCB	2.00	0.485	24.2 #	8:25	1.51	
13C-15-DiCB	2.00	0.876	43.8	13:00	1.59	
13C-19-TrCB	2.00	0.733	36.6	10:41	1.06	
13C-37-TrCB	2.00	1.22	61.1	19:59	1.10	
13C-54-TeCB	2.00	0.964	48.2	13:14	0.82	
13C-81-TeCB	2.00	1.06	53.0	28:18	0.77	
13C-77-TeCB	2.00	1.06	52.9	29:05	0.78	
13C-104-PeCB	2.00	1.04	52.1	18:33	1.60	
13C-123-PeCB	2.00	1.01	50.7	31:45	1.64	
13C-118-PeCB	2.00	0.953	47.6	32:12	1.57	
13C-114-PeCB	2.00	0.959	47.9	32:57	1.62	
13C-105-PeCB	2.00	0.957	47.9	33:54	1.54	
13C-126-PeCB	2.00	1.08	53.9	38:27	1.66	
13C-155-HxCB	2.00	1.18	58.9	25:09	1.22	
13C-167-HxCB	2.00	1.10	54.8	41:11	1.31	
13C-156,157-HxCB	4.00	2.31	57.8	42:57	1.29	
13C-169-HxCB	2.00	1.18	59.1	48:02	1.28	
13C-188-HpCB	2.00	1.03	51.6	32:52	1.06	
13C-189-HpCB	2.00	1.16	57.9	51:57	1.06	
13C-202-OcCB	2.00	0.893	44.6	40:45	0.88	
13C-205-OcCB	2.00	1.11	55.3	56:01	0.94	
13C-208-NoCB	2.00	1.06	53.1	51:05	0.75	
13C-206-NoCB	2.00	1.02	51.0	58:47	0.77	
13C-209-DeCB	2.00	0.908	45.4	61:19	1.24	
Cleanup Standards			(40-125%)			
13C-28-TrCB	2.00	1.18	58.9	15:44	1.11	
13C-111-PeCB	2.00	1.03	51.5	29:02	1.60	
13C-178-HpCB	2.00	1.13	56.5	37:19	1.01	
Injection Standards						
13C-9-DiCB	2.00			9:48	1.56	
13C-52-TeCB	2.00			17:33	0.81	
13C-101-PeCB	2.00			25:30	1.60	
13C-138-HxCB	2.00			36:40	1.30	
13C-194-OcCB	2.00			55:16	0.93	

Analyzed By: HMP

Date: 01/26/07

Reviewed By: [signature]

Date: 2/7/07

161;	194-OcCB;	8.35e+07;	3.95e+07;	4.40e+07;	0.90;y;0.987;	55:28;	11884.544;22.1953;	1271;y;	1425;y;n;4.6e+06;3.6e+03;5.0e+06;3.5e+03
165;	206-NoCB;	1.94e+07;	8.72e+06;	1.07e+07;	0.81;y;1.001;	58:59;	2556.756;12.7379;	413;y;	528;y;n;1.0e+06;2.5e+03;1.3e+06;2.4e+03
166;	209-DeCB;	4.57e+07;	2.48e+07;	2.09e+07;	1.19;y;1.000;	1:01:30;	5571.377;10.9734;	1042;y;	1279;y;n;3.2e+06;3.1e+03;2.5e+06;1.9e+03
Extraction Standards									
167;	13C-1-MoCB;	*;	*;	*;	*;n;	*; NotFnd;	*;27.4213;	*;n;	*;n;n; *;4.1e+03; *;8.3e+04
168;	13C-3-MoCB;	*;	*;	*;	*;n;	*; NotFnd;	*;28.0468;	*;n;	*;n;n; *;4.1e+03; *;8.3e+04
169;	13C-4-DiCB;	8.02e+05;	4.70e+05;	3.32e+05;	1.42;y;0.859;	8:27;	23.288; 2.7187;	63;y;	40;y;n;2.3e+05;3.7e+03;1.4e+05;3.5e+03
170;	13C-15-DiCB;	1.60e+06;	1.01e+06;	5.91e+05;	1.70;y;1.324;	13:01;	31.942; 1.5624;	61;y;	44;y;n;2.1e+05;3.5e+03;1.1e+05;2.5e+03
171;	13C-19-TrCB;	1.37e+06;	6.26e+05;	7.45e+05;	0.84;n;1.092;	10:44;	46.962;24.6684;	6;y;	6;y;n;1.7e+05;2.8e+04;1.5e+05;2.7e+04
172;	13C-37-TrCB;	1.98e+06;	9.98e+05;	9.83e+05;	1.01;y;1.138;	19:59;	43.793;11.7979;	6;y;	18;y;n;1.8e+05;3.0e+04;1.7e+05;9.4e+03
173;	13C-54-TeCB;	1.43e+06;	7.47e+05;	6.81e+05;	1.10;n;0.754;	13:15;	34.175; 1.8922;	68;y;	88;y;y;2.1e+05;3.0e+03;2.5e+05;2.8e+03
174;	13C-81-TeCB;	1.82e+06;	8.37e+05;	9.80e+05;	0.85;y;1.613;	28:20;	36.887; 1.5650;	41;y;	42;y;n;1.1e+05;2.7e+03;1.2e+05;2.9e+03
175;	13C-77-TeCB;	1.69e+06;	7.11e+05;	9.74e+05;	0.73;y;1.657;	29:07;	34.311; 1.5696;	40;y;	49;y;y;1.1e+05;2.7e+03;1.4e+05;2.9e+03
176;	13C-104-PeCB;	1.48e+06;	8.96e+05;	5.80e+05;	1.55;y;0.727;	18:33;	43.420; 4.7068;	54;y;	42;y;n;1.8e+05;3.3e+03;1.5e+05;3.7e+03
177;	13C-123-PeCB;	1.63e+06;	9.44e+05;	6.88e+05;	1.37;y;1.245;	31:48;	37.521; 4.8274;	27;y;	20;y;n;1.1e+05;4.1e+03;1.0e+05;5.1e+03
178;	13C-118-PeCB;	1.96e+06;	1.18e+06;	7.74e+05;	1.53;y;1.265;	32:18;	42.100; 4.5121;	27;y;	16;y;n;1.1e+05;4.1e+03;8.3e+04;5.1e+03
179;	13C-114-PeCB;	1.53e+06;	9.08e+05;	6.23e+05;	1.46;y;1.293;	33:01;	31.727; 4.3508;	27;y;	14;y;n;1.1e+05;4.1e+03;7.0e+04;5.1e+03
180;	13C-105-PeCB;	1.50e+06;	9.29e+05;	5.75e+05;	1.61;y;1.330;	33:58;	33.116; 4.6194;	27;y;	13;y;y;1.1e+05;4.1e+03;6.6e+04;5.1e+03
181;	13C-126-PeCB;	1.25e+06;	8.06e+05;	4.46e+05;	1.81;n;1.512;	38:36;	30.081; 5.0447;	20;y;	12;y;y;8.1e+04;4.1e+03;6.3e+04;5.1e+03
182;	13C-155-HxCB;	1.57e+06;	8.93e+05;	6.73e+05;	1.33;y;0.684;	25:10;	40.566; 5.3503;	46;y;	33;y;n;1.4e+05;3.1e+03;1.3e+05;4.0e+03
183;	13C-167-HxCB;	1.29e+06;	7.52e+05;	5.43e+05;	1.39;y;1.124;	41:20;	30.376; 3.9111;	35;y;	22;y;y;1.0e+05;2.9e+03;6.2e+04;2.8e+03
184;	13C-156,157-HxCB;	2.65e+06;	1.50e+06;	1.15e+06;	1.30;y;1.172;	43:06;	59.661; 3.7495;	43;y;	34;y;y;1.3e+05;2.9e+03;9.6e+04;2.8e+03
185;	13C-169-HxCB;	1.20e+06;	7.09e+05;	4.94e+05;	1.43;n;1.311;	48:14;	29.129; 4.0374;	24;y;	23;y;y;6.9e+04;2.9e+03;6.5e+04;2.8e+03
186;	13C-188-HpCB;	1.35e+06;	6.79e+05;	6.66e+05;	1.02;y;0.594;	32:55;	55.052;15.5481;	12;y;	5;y;n;7.3e+04;5.9e+03;7.5e+04;1.5e+04
187;	13C-189-HpCB;	1.53e+06;	8.43e+05;	6.89e+05;	1.22;n;0.940;	52:06;	61.978;29.2340;	7;y;	4;y;y;1.1e+05;1.6e+04;8.3e+04;2.3e+04
188;	13C-202-OcCB;	8.51e+05;	4.10e+05;	4.41e+05;	0.93;y;0.736;	40:50;	36.335; 4.8136;	15;y;	19;y;y;5.2e+04;3.4e+03;5.2e+04;2.8e+03
189;	13C-205-OcCB;	1.00e+06;	5.70e+05;	4.34e+05;	1.31;n;1.014;	56:12;	47.161;47.4754;	5;y;	2;n;y;8.4e+04;1.6e+04;7.2e+04;4.0e+04
190;	13C-208-NoCB;	1.15e+06;	4.73e+05;	6.73e+05;	0.70;y;0.924;	51:14;	58.726;53.7999;	4;y;	2;n;y;6.4e+04;1.5e+04;8.5e+04;4.3e+04
191;	13C-206-NoCB;	7.82e+05;	4.14e+05;	3.68e+05;	1.12;n;1.063;	58:56;	46.644;62.6953;	4;y;	1;n;y;5.5e+04;1.5e+04;6.3e+04;4.3e+04
192;	13C-209-DeCB;	7.38e+05;	3.71e+05;	3.67e+05;	1.01;y;1.109;	1:01:29;	41.156; 5.8924;	15;y;	36;y;n;4.6e+04;3.1e+03;9.7e+04;2.7e+03
Cleanup Standards									
193;	13C-28-TrCB;	2.59e+06;	1.26e+06;	1.33e+06;	0.95;y;0.896;	15:44;	53.792;12.5814;	11;y;	12;y;y;2.4e+05;2.3e+04;2.7e+05;2.2e+04
194;	13C-111-PeCB;	1.63e+06;	1.05e+06;	5.79e+05;	1.82;n;1.139;	29:05;	38.251; 3.8939;	37;y;	19;y;n;1.3e+05;3.5e+03;7.2e+04;3.8e+03
195;	13C-178-HpCB;	7.80e+05;	3.72e+05;	4.08e+05;	0.91;y;1.017;	37:24;	26.621;20.7783;	9;y;	4;y;y;5.1e+04;5.9e+03;6.0e+04;1.5e+04
Injection Standards									
196;	13C-9-DiCB;	4.52e+06;	2.82e+06;	1.70e+06;	1.66;y;0.267;	9:50;	107.079; 4.1476;	183;y;	158;y;n;6.4e+05;3.5e+03;4.0e+05;2.5e+03
197;	13C-52-TeCB;	3.35e+06;	1.50e+06;	1.84e+06;	0.81;y;0.478;	17:34;	120.950; 6.4307;	83;y;	181;y;n;3.0e+05;3.6e+03;4.6e+05;2.6e+03
198;	13C-101-PeCB;	2.96e+06;	1.70e+06;	1.26e+06;	1.36;y;0.694;	25:32;	112.086; 8.0372;	70;y;	40;y;n;2.4e+05;3.5e+03;1.5e+05;3.8e+03
199;	13C-138-HxCB;	2.88e+06;	1.59e+06;	1.29e+06;	1.24;y; *;	36:47;	88.160; 6.7557;	35;y;	27;y;n;1.5e+05;4.3e+03;1.5e+05;5.4e+03
200;	13C-194-OcCB;	1.61e+06;	7.42e+05;	8.64e+05;	0.86;y;1.507;	55:27;	56.305;56.7511;	7;y;	4;y;y;1.1e+05;1.6e+04;1.6e+05;4.0e+04

stds out for the sample

Filename ; b20jan07a *1668A*
Sample ; 4
Acquired ; 20-JAN-07 17:51:24
Processed ; 6-FEB-07 13:43:29
Sample ID ; G296-346-1D d10
Cal Table ; m1668a-b010906d
Results Table ; m1668a-b012007a
Comments ;

Ent;	Name;	Resp;	Ion 1;	Ion 2;	RA;?;	RRT;	RT;	Conc;	EDL;	S/N1;?;	S/N2;?;M;Signal1;Noise 1;Signal2;Noise 2
10 ;	8-DiCB;	3.47e+06;	2.16e+06;	1.31e+06;	1.65;y;1.243;	10:30;	217.025;	8.0047;	174;y;	61;y;n;7.6e+05;4.4e+03;4.5e+05;7.4e+03
16 ;	18,30-TrCB;	1.97e+07;	1.02e+07;	9.47e+06;	1.08;y;1.138;	12:13;	1329.642;	8.0285;	1351;y;	459;y;n;3.0e+06;2.2e+03;2.6e+06;5.7e+03
26 ;	31-TrCB;	2.98e+07;	1.53e+07;	1.45e+07;	1.05;y;0.774;	15:28;	1560.221;	6.2146;	1703;y;	621;y;n;3.8e+06;2.2e+03;3.6e+06;5.7e+03
27 ;	20,28-TrCB;	2.59e+07;	1.33e+07;	1.27e+07;	1.05;y;0.789;	15:46;	1304.447;	5.9796;	1258;y;	458;y;n;2.8e+06;2.2e+03;2.6e+06;5.7e+03
34 ;	37-TrCB;	1.34e+07;	6.79e+06;	6.58e+06;	1.03;y;1.002;	20:01;	670.731;	111.72»;	20;y;	17;y;n;1.2e+06;6.2e+04;1.2e+06;6.9e+04
39 ;	52-TeCB;	1.10e+09;	4.87e+08;	6.13e+08;	0.79;y;1.327;	17:35;	84516.478;	9.8329;	26791;y;	37618;y;n;1.0e+08;3.8e+03;1.3e+08;3.4e+03
42 ;	49,69-TeCB;	2.45e+08;	1.08e+08;	1.36e+08;	0.79;y;1.365;	18:05;	15563.185;	8.1314;	5807;y;	8361;y;n;2.2e+07;3.8e+03;2.9e+07;3.4e+03
44 ;	44,47,65-TeCB;	4.37e+08;	1.94e+08;	2.44e+08;	0.80;y;1.406;	18:38;	30215.238;	8.8396;	9502;y;	13534;y;n;3.7e+07;3.8e+03;4.6e+07;3.4e+03
56 ;	61,70,74,76-TeCB;	8.52e+08;	3.75e+08;	4.77e+08;	0.79;y;0.812;	23:00;	45119.677;	25.8530;	3439;y;	4689;y;n;5.0e+07;1.4e+04;6.2e+07;1.3e+04
57 ;	66-TeCB;	2.50e+08;	1.11e+08;	1.39e+08;	0.80;y;0.826;	23:24;	13196.831;	25.7887;	1144;y;	1555;y;y;1.6e+07;1.4e+04;2.1e+07;1.3e+04
59 ;	56-TeCB;	9.38e+07;	4.12e+07;	5.27e+07;	0.78;y;0.856;	24:15;	5039.914;	26.2078;	417;y;	564;y;n;6.0e+06;1.4e+04;7.5e+06;1.3e+04
60 ;	60-TeCB;	3.37e+07;	1.48e+07;	1.88e+07;	0.79;y;0.865;	24:31;	1776.986;	25.7647;	140;y;	195;y;n;2.0e+06;1.4e+04;2.6e+06;1.3e+04
64 ;	81-TeCB;	*;	*;	*;	*;n;	*;	NotFnd;	*;	29.1749;	*;n;	*;n;n; *;1.4e+04; *;1.3e+04
65 ;	77-TeCB;	3.63e+07;	1.58e+07;	2.05e+07;	0.77;y;1.001;	29:09;	1690.226;	25.8412;	116;y;	152;y;n;1.7e+06;1.4e+04;2.0e+06;1.3e+04
70 ;	95-PeCB;	1.35e+09;	8.26e+08;	5.21e+08;	1.58;y;1.183;	21:57;	110520.681;	14.7937;	29969;y;	28175;y;n;1.4e+08;4.7e+03;8.8e+07;3.1e+03
78 ;	90,101,113-PeCB;	1.83e+09;	1.12e+09;	7.07e+08;	1.59;y;0.803;	25:33;	135805.786;	13.3822;	31694;y;	30198;y;n;1.5e+08;4.7e+03;9.5e+07;3.1e+03
80 ;	99-PeCB;	8.28e+08;	5.07e+08;	3.21e+08;	1.58;y;0.827;	26:17;	54879.302;	11.9567;	12494;y;	12108;y;n;5.9e+07;4.7e+03;3.8e+07;3.1e+03
82 ;	86,87,97,108,119,125-PeCB;	1.40e+09;	8.57e+08;	5.43e+08;	1.58;y;0.851;	27:04;	101443.759;	13.0700;	14253;y;	13751;y;n;6.7e+07;4.7e+03;4.3e+07;3.1e+03
90 ;	123-PeCB;	2.68e+07;	1.65e+07;	1.03e+07;	1.61;y;1.002;	31:52;	1442.977;	41.6104;	139;y;	112;y;y;2.6e+06;1.9e+04;1.6e+06;1.5e+04
92 ;	118-PeCB;	1.74e+09;	1.07e+09;	6.72e+08;	1.58;y;1.001;	32:19;	75843.398;	44.2414;	5564;y;	4426;y;n;1.0e+08;1.9e+04;6.5e+07;1.5e+04
94 ;	114-PeCB;	3.38e+07;	2.04e+07;	1.34e+07;	1.52;y;1.002;	33:04;	1953.500;	49.0853;	109;y;	84;y;y;2.0e+06;1.9e+04;1.2e+06;1.5e+04
95 ;	105-PeCB;	7.11e+08;	4.38e+08;	2.73e+08;	1.61;y;1.001;	34:01;	41299.948;	49.7317;	2196;y;	1755;y;n;4.1e+07;1.9e+04;2.6e+07;1.5e+04
97 ;	126-PeCB;	6.02e+06;	3.52e+06;	2.50e+06;	1.41;y;0.999;	38:33;	376.574;	53.6171;	40;y;	35;y;y;7.6e+05;1.9e+04;5.1e+05;1.5e+04
104;	135,151-HxCB;	3.91e+08;	2.22e+08;	1.70e+08;	1.31;y;1.169;	29:25;	46850.400;	51.1497;	1986;y;	1851;y;n;1.8e+07;9.0e+03;1.4e+07;7.4e+03
113;	132-HxCB;	5.31e+08;	2.98e+08;	2.33e+08;	1.28;y;1.289;	32:26;	65793.818;	134.93»;	1177;y;	1394;y;n;3.0e+07;2.5e+04;2.3e+07;1.7e+04
116;	146-HxCB;	2.00e+08;	1.13e+08;	8.70e+07;	1.29;y;0.824;	34:04;	19864.211;	108.32»;	439;y;	530;y;n;1.1e+07;2.5e+04;8.8e+06;1.7e+04
118;	153,168-HxCB;	1.40e+09;	7.80e+08;	6.15e+08;	1.27;y;0.846;	34:58;	136662.451;	106.57»;	2901;y;	3476;y;n;7.3e+07;2.5e+04;5.8e+07;1.7e+04
123;	129,138,163-HxCB;	1.76e+09;	9.89e+08;	7.67e+08;	1.29;y;0.891;	36:49;	195503.243;	121.11»;	3721;y;	4448;y;n;9.4e+07;2.5e+04;7.4e+07;1.7e+04
125;	158-HxCB;	2.12e+08;	1.18e+08;	9.36e+07;	1.26;y;0.904;	37:23;	16242.635;	83.4728;	427;y;	498;y;n;1.1e+07;2.5e+04;8.3e+06;1.7e+04
126;	128,166-HxCB;	3.17e+08;	1.79e+08;	1.39e+08;	1.29;y;0.936;	38:42;	30925.286;	106.02»;	658;y;	751;y;n;1.7e+07;2.5e+04;1.3e+07;1.7e+04
129;	167-HxCB;	1.05e+08;	5.89e+07;	4.59e+07;	1.28;y;1.001;	41:22;	7313.030;	31.9565;	737;y;	393;y;n;5.6e+06;7.5e+03;4.5e+06;1.1e+04
130;	156,157-HxCB;	3.39e+08;	1.90e+08;	1.48e+08;	1.28;y;1.000;	43:06;	22758.085;	45.8594;	2191;y;	1113;y;n;1.7e+07;7.5e+03;1.3e+07;1.1e+04
131;	169-HxCB;	*;	*;	*;	*;n;	*;	NotFnd;	*;	37.5147;	*;n;	*;n;n; *;7.5e+03; *;1.1e+04
139;	187-HpCB;	1.95e+08;	1.02e+08;	9.33e+07;	1.09;y;1.179;	38:48;	18210.784;	25.7851;	1257;y;	3297;y;n;1.0e+07;7.9e+03;9.3e+06;2.8e+03
141;	183,185-HpCB;	1.44e+08;	7.25e+07;	7.12e+07;	1.02;y;1.206;	39:42;	12917.183;	32.3719;	1083;y;	917;y;n;7.1e+06;6.5e+03;6.9e+06;7.5e+03
143;	177-HpCB;	1.16e+08;	5.93e+07;	5.65e+07;	1.05;y;1.238;	40:45;	11986.148;	37.3058;	912;y;	760;y;n;6.0e+06;6.5e+03;5.7e+06;7.5e+03
148;	180,193-HpCB;	5.80e+08;	2.98e+08;	2.81e+08;	1.06;y;0.868;	45:14;	48640.783;	30.2288;	4516;y;	3724;y;n;3.0e+07;6.5e+03;2.8e+07;7.5e+03
150;	170-HpCB;	2.62e+08;	1.34e+08;	1.27e+08;	1.05;y;0.906;	47:12;	28261.516;	38.8672;	2130;y;	1735;y;n;1.4e+07;6.5e+03;1.3e+07;7.5e+03
152;	189-HpCB;	1.78e+07;	9.35e+06;	8.47e+06;	1.10;y;1.001;	52:09;	1021.968;	14.2706;	151;y;	247;y;n;9.7e+05;6.4e+03;9.5e+05;3.9e+03
154;	201-OcCB;	1.00e+07;	4.88e+06;	5.14e+06;	0.95;y;1.036;	42:18;	1128.915;	12.2947;	294;y;	146;y;n;4.7e+05;1.6e+03;4.9e+05;3.4e+03
158;	196-OcCB;	3.73e+07;	1.84e+07;	1.89e+07;	0.97;y;0.877;	49:18;	5882.501;	17.1762;	1177;y;	605;y;n;1.9e+06;1.6e+03;2.1e+06;3.4e+03
159;	203-OcCB;	4.32e+07;	2.04e+07;	2.28e+07;	0.90;y;0.883;	49:37;	5742.445;	14.4786;	1487;y;	704;y;n;2.4e+06;1.6e+03;2.4e+06;3.4e+03
160;	195-OcCB;	3.39e+07;	1.62e+07;	1.77e+07;	0.91;y;0.920;	51:42;	4974.430;	22.8929;	470;y;	543;y;n;1.7e+06;3.6e+03;1.9e+06;3.5e+03

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: RA
Date: 3/5/07
DV Level: II (III) IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002) X NFG Region III Draft Guidance (March 1999)

Project Name: Radford SWMU 54
Project Number: 11656351
Laboratory: SGS
SDG No.: 6246-346
Method No.: 8290

1.0 General: Chain-of-Custody

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times

		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B". (use 10X for OCDD/OCDF data) TEQ values should not be calculated for isomers flagged B.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.			✓

Notes: The MBs displayed pos. detections. Ass. field sample results <5X, B/A
<10X for OCDD/OCDF

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-"; by greater than 50%, "J+/R-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "N+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits	
4	M/M+2	0.77	0.65- 0.89	
5	M+2/M+4	1.55	1.32- 1.78	
6	M+2/M+2	1.24	1.05- 1.43	
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	
~~7~~	~~M+2/M+4~~	~~1.04~~	~~0.88- 1.20~~	N/A for APPIX
~~8~~	~~M+2~~	~~0.89~~	~~0.76- 1.02~~	N/A for APPIX

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓		

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed at the same frequency as calibrations that defines descriptor switching times of scan ranges? If not, make a note in DV Report.	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≤ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

OPR/OPRD was performed ok

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards

		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.		✓	
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		
8.3	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.		✓	

Notes: Sample 545B40A Ex. Std 13C12-OCDD <40%. at 39.7%.
and Sample results Pos → J, i

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.		✓	
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes: See attached 545B42A) DUP-1, 2,3,7,8-TCDF outside QC 149%. RPD → J, f

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓	✓	
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.	✓		
10.4	Is the signal to noise ≥ 2.5 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥ 2.5 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Are the two identification peak apexs within 2 seconds for positive identifications? If not, result is reported as non-detect,	✓		
10.7	Are polychlorinated diphenyl ether (PCDPE) interferences in the PCDPE channel with a S/N ratio > 2.5 and with a RT within ± 2 seconds? If yes, qualify positive furan results I.		✓	
10.8	Was a second column confirmation used for positive 2,3,7,8-TCDF?	✓		
	If no, apply "R" to the positive 2,3,7,8-TCDF results.			
	If yes, calculate the %D between the two column results, report the lower of the two values if the %D is > 25% and qualify J.			
10.9	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.10	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes: Several compds exceeded the calib range and were flagged "E" by the lab. These were flagged "UJ/J" by reviewer.

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
11.1	Are Isotopic ratios for a detected analyte within the following established control limits...?	✓		

# Cl ion atoms	Ion Type	Theoretical	Control Limits	RIII Expanded Limits
4	M/M+2	0.77	0.65- 0.89	0.58- 0.96
5	M+2/M+4	1.55	1.32- 1.78	1.16- 1.94
6	M+2/M+2	1.24	1.05- 1.43	0.93- 1.55
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	0.38- 0.64
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	0.33- 0.55
7	M+2/M+4	1.04	0.88- 1.2	0.78- 1.30
8	M+2	0.89	0.76- 1.02	0.67- 1.11

	For positive field sample results with ion abundance ratios outside the method control limits but within the expanded RIII limits, The laboratory should report the concentration as an estimated maximum possible concentration (EMPC). Region III requires this type of result to be reported as true PCDD/PCDF isomer. The validator shall also qualify J.			
	For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.			
	For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).			
11.2	RIII separates 2,3,7,8-chlorinated isomers from total isomers for each congener group and reports results as 2,3,7,8-chlorine substituted and 'Other Total' PCDD/PCDF isomers. If laboratory did not report these separate, make a note in the DV report.	✓		

Notes: Several EMPCs were reported. If ion ratio ≤ 25% → J, UJ
if " " > 25% → changed to NDSV

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)		✓	
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported:			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.895				
1,2,3,7,8-PeCDD	ND	0.500				
1,2,3,4,7,8-HxCDD	ND	0.500				
1,2,3,6,7,8-HxCDD	ND	0.517				
1,2,3,7,8,9-HxCDD	ND	0.504				
1,2,3,4,6,7,8-HpCDD	ND	1.06				
OCDD	9.71 X10 =97.1			42:34	0.85	A
2,3,7,8-TCDF	ND	0.451				
1,2,3,7,8-PeCDF	ND	0.500				
2,3,4,7,8-PeCDF	ND	0.500				
1,2,3,4,7,8-HxCDF	ND	0.500				
1,2,3,6,7,8-HxCDF	ND	0.500				
2,3,4,6,7,8-HxCDF	ND	0.500				
1,2,3,7,8,9-HxCDF	ND	0.500				
1,2,3,4,6,7,8-HpCDF	ND	0.573				
1,2,3,4,7,8,9-HpCDF	ND	0.713				
OCDF	ND	2.44				
Total TCDDs	ND	0.895				
Total PeCDDs	ND	0.500				
Total HxCDDs	ND	0.517				
Total HpCDDs	ND	1.06				
Total TCDFs	ND	0.451				
Total PeCDFs	ND	0.500				
Total HxCDFs	ND	0.500				
Total HpCDFs	ND	0.713				
WHO-2005 TEQ (ND=0)	0.00291		0.00291			
WHO-2005 TEQ (ND=½)	0.994		0.994			

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10.0	g
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14062	
Project ID:			Instrument:	HRMS1	
Sample ID:			Filename:	a14jan07c_5-3	
Collection Date/Time:			Retchk:	a14jan07c_4-14	
Receipt Date/Time:			Begin ConCal:	a14jan07c_4-14	
Extraction Date:	01/11/07		End ConCal:	a14jan07c_5-14	
Analysis Date/Time:	01/16/07	3:07	Initial Cal:	m8290-071006e	

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.149					
1,2,3,7,8-PeCDD	ND	0.500					
1,2,3,4,7,8-HxCDD	ND	0.500					
1,2,3,6,7,8-HxCDD	ND	0.500					
1,2,3,7,8,9-HxCDD	ND	0.500					
1,2,3,4,6,7,8-HpCDD	0.222 X5	=1.11		38:49	1.15		A
OCDD	1.66 X10	=16.6		42:37	0.96		A
2,3,7,8-TCDF	EMPC	0.100	0.128	28:49	0.96	*	A
1,2,3,7,8-PeCDF	ND	0.500					
2,3,4,7,8-PeCDF	0.0620 X5	=0.31		33:09	1.77		A
1,2,3,4,7,8-HxCDF	ND	0.500					
1,2,3,6,7,8-HxCDF	ND	0.500					
2,3,4,6,7,8-HxCDF	ND	0.500					
1,2,3,7,8,9-HxCDF	ND	0.500					
1,2,3,4,6,7,8-HpCDF	0.100 X5	=0.5		37:40	1.08		A
1,2,3,4,7,8,9-HpCDF	ND	0.500					
OCDF	0.288 X10	=2.88		42:52	0.89		A
Total TCDDs	ND	0.149					
Total PeCDDs	ND	0.500					
Total HxCDDs	ND	0.500					
Total HpCDDs	0.412 X5	=2.06					
Total TCDFs	ND	0.100	0.212				
Total PeCDFs	0.0620 X5	=0.31					
Total HxCDFs	ND	0.500					
Total HpCDFs	0.100 X5	=0.5					
WHO-2005 TEQ (ND=0)	0.0224		0.0352				
WHO-2005 TEQ (ND=½)	0.537		0.545				

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10.0	g
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14072	
Project ID:			Instrument:	HRMS1	
Sample ID:			Filename:	a19jan07a-4	
Collection Date/Time:			Retchk:	a19jan07a-1	
Receipt Date/Time:			Begin ConCal:	a19jan07a-1	
Extraction Date:	01/17/07		End ConCal:	a19jan07a-8	
Analysis Date/Time:	01/19/07	10:36	Initial Cal:	m8290-071006e	

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.115				
1,2,3,7,8-PeCDD	ND	0.500				
1,2,3,4,7,8-HxCDD	ND	1.15				
1,2,3,6,7,8-HxCDD	ND	1.18				
1,2,3,7,8,9-HxCDD	ND	1.27				
1,2,3,4,6,7,8-HpCDD	ND	1.24				
OCDD	2.32 x10= 23.2			44.11	0.86	A
2,3,7,8-TCDF	0.146 x5= 0.73			30.26	0.86	A
1,2,3,7,8-PeCDF	ND	0.500				
2,3,4,7,8-PeCDF	ND	0.500				
1,2,3,4,7,8-HxCDF	ND	0.500				
1,2,3,6,7,8-HxCDF	ND	0.500				
2,3,4,6,7,8-HxCDF	ND	0.500				
1,2,3,7,8,9-HxCDF	ND	0.500				
1,2,3,4,6,7,8-HpCDF	ND	0.654				
1,2,3,4,7,8,9-HpCDF	ND	0.809				
OCDF	ND	1.00				
Total TCDDs	ND	0.115				
Total PeCDDs	ND	0.500				
Total HxCDDs	ND	1.27				
Total HpCDDs	ND	1.24				
Total TCDFs	0.232 x5= 1.16		0.276			
Total PeCDFs	ND	0.500				
Total HxCDFs	ND	0.500				
Total HpCDFs	ND	0.809				
WHO-2005 TEQ (ND=0)	0.0153		0.0153			
WHO-2005 TEQ (ND=½)	0.699		0.699			

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10.0	g
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14074	
Project ID:			Instrument:	HRMS3	
Sample ID:			Filename:	c26jan07d-4	
Collection Date/Time:			Retchk:	c26jan07d-1	
Receipt Date/Time:			Begin ConCal:	c26jan07d-1	
Extraction Date:	01/18/07		End ConCal:	c26jan07d-15	
Analysis Date/Time:	01/26/07	16:59	Initial Cal:	m8290-c110206a	

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.341				
1,2,3,7,8-PeCDD	ND	0.500				
1,2,3,4,7,8-HxCDD	ND	0.878				
1,2,3,6,7,8-HxCDD	ND	0.910				
1,2,3,7,8,9-HxCDD	ND	0.887				
1,2,3,4,6,7,8-HpCDD	ND	2.25				
OCDD	3.24 X 10 = 32.4			42:42	0.93	A
2,3,7,8-TCDF	0.430 X 5 = 2.15			28:51	0.72	A
1,2,3,7,8-PeCDF	ND	0.500				
2,3,4,7,8-PeCDF	ND	0.500				
1,2,3,4,7,8-HxCDF	ND	0.555				
1,2,3,6,7,8-HxCDF	ND	0.531				
2,3,4,6,7,8-HxCDF	ND	0.550				
1,2,3,7,8,9-HxCDF	ND	0.625				
1,2,3,4,6,7,8-HpCDF	ND	0.847				
1,2,3,4,7,8,9-HpCDF	ND	1.05				
OCDF	ND	1.00				
Total TCDDs	ND	0.341				
Total PeCDDs	ND	0.500				
Total HxCDDs	ND	0.910				
Total HpCDDs	ND	2.25				
Total TCDFs	0.704 X 5 = 3.52					
Total PeCDFs	ND	0.500				
Total HxCDFs	ND	0.625				
Total HpCDFs	ND	1.05				
WHO-2005 TEQ (ND=0)	0.0440		0.0440			
WHO-2005 TEQ (ND=½)	0.815		0.815			

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10.0	g
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:			Instrument:	HRMS1	
Sample ID:			Filename:	a24jan07b_4-3	
Collection Date/Time:			Retchk:	a24jan07b_3-14	
Receipt Date/Time:			Begin ConCal:	a24jan07b_3-14	
Extraction Date:	01/24/07		End ConCal:	a24jan07b_4-14	
Analysis Date/Time:	01/25/07	22:22	Initial Cal:	m8290-071006e	

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.102				
1,2,3,7,8-PeCDD	ND	0.500				
1,2,3,4,7,8-HxCDD	ND	0.500				
1,2,3,6,7,8-HxCDD	ND	0.500				
1,2,3,7,8,9-HxCDD	ND	0.500				
1,2,3,4,6,7,8-HpCDD	0.384 X5	=1.92		40:07	0.98	A
OCDD	2.89 X10	=28.9		44:22	0.88	A
2,3,7,8-TCDF	0.358 X5	=1.79		30:40	0.78	A
1,2,3,7,8-PeCDF	0.110 X5	=0.55		33:21	1.76	A
2,3,4,7,8-PeCDF	0.102 X5	=0.51		33:58	1.70	A
1,2,3,4,7,8-HxCDF	ND	0.500				
1,2,3,6,7,8-HxCDF	ND	0.500				
2,3,4,6,7,8-HxCDF	ND	0.500				
1,2,3,7,8,9-HxCDF	ND	0.500				
1,2,3,4,6,7,8-HpCDF	ND	0.500				
1,2,3,4,7,8,9-HpCDF	ND	0.500				
OCDF	ND	1.00				
Total TCDDs	ND	0.102				
Total PeCDDs	ND	0.500				
Total HxCDDs	ND	0.500				
Total HpCDDs	0.384 X5	=1.92	0.706			
Total TCDFs	0.564 X5	=2.82				
Total PeCDFs	0.212 X5	=1.06				
Total HxCDFs	ND	0.500				
Total HpCDFs	ND	0.500				
WHO-2005 TEQ (ND=0)	0.0744		0.0744			
WHO-2005 TEQ (ND=½)	0.556		0.556			

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10.0	g
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14092	
Project ID:			Instrument:	HRMS1	
Sample ID:			Filename:	a31jan07a-4	
Collection Date/Time:			Retchk:	a31jan07a-1	
Receipt Date/Time:			Begin ConCal:	a31jan07a-1	
Extraction Date:	01/29/07		End ConCal:	a31jan07a-6	
Analysis Date/Time:	01/31/07	11:08	Initial Cal:	m8290-071006e	

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066952

(1)

CLIENT: URS

CONTACT: Roshanak PHONE NO: (804) 965-9000

PROJECT: TWNU54 ✓ SITE/PWSID#:

REPORTS TO: Roshanak URS E-MAIL: Roshanak_Asgar

FAX NO.: (804) 965-9764

INVOICE TO: URS QUOTE #

P.O. NUMBER

SGS Reference: G 2960-346

PAGE 1 OF 3

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives Used	Analysis Required (3) Diesel Fuel	PCB Congeners	REMARKS
	545B46A ✓	1-9-07	1030	Soil	1			✓	✓	
	545B46C ✓		1045		1			✓	✓	
	545B54C ✓ ✓		1005		1			✓		
	545B45B ✓ ✓		918		1			✓		
	545B54A ✓ ✓		945		1			✓		
	545B45A ✓ ✓		914		1			✓		
	545B54B ✓ ✓		955		1			✓		
	545B45C ✓ ✓		927		1			✓		
	545B41C ✓ ✓		900		1			✓		
	41B ✓ ✓		855		1			✓		

(5)

	Date	Time	Received By:
Collected/Relinquished By: (1)	1/9/07	1730	
Relinquished By: (2)	1/10/07	950	
Relinquished By: (3)			
Relinquished By: (4)			

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 3.4

Special Deliverable Requirements:

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

8991, 2, 26

6

200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

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066951

(1)

CLIENT: URS

CONTACT: Roshanak, Aryan PHONE NO:(804) 965-9000

PROJECT: 11656531 SITE/PWSID#: SWMU 54 - RFI

REPORTS TO: E-MAIL: roshanak_aryan@urscorp.com

Roshanak, Aryan FAX NO.:(804) 965-9764

INVOICE TO: Client QUOTE #

P.O. NUMBER

SGS Reference:

PAGE 2 OF 3

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives Used	(3) Analysis Required: Dioxin/Furans 8290	REMARKS
	545B42B	1-8-07	1615	Soil	1			✓	
	545B42C		1625	Soil	1			✓	
	DUP-1		—	Soil	1			✓	
	545B77C/75/75D	1-9-07	1530					✓	
	~~545B~~ DUP-4/N	1-9-07	—					✓	
	545B77B		1520					✓	
	545B77C		1530					✓	
	545353A		1050					✓	
	545877A		1510						
	~~545B~~ DUP-2		—						

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
	1/9/07	1710	
Relinquished By: (2)	Date	Time	Received By:
	1/10/07	950	Amy DiLaney
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 3.4 °F:

Special Deliverable Requirements:

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

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066949

(1)

CLIENT: URS

CONTACT: Roshanak Aryan PHONE NO:(804) 965-9000

PROJECT: 11656531 SITE/PWSID#: SWMU 54-RFI

REPORTS TO: Roshanak Aryan E-MAIL: roshanak_aryan@urscorp.com FAX NO.:(804) 965-9764

INVOICE TO: client QUOTE #

P.O. NUMBER

SGS Reference:

PAGE 3 OF 3

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives Used / Analysis Required (3) Dioxin/Furans 8290	REMARKS
	545B43A	1-8-07	14:46	Soil	1	G	✓	
	545B43B		14:50	Soil	1	G	✓	
	545B43C		14:55	Soil	1	G	✓	
	545B40A		15:15	Soil	1	G	✓	
	545B40B		15:25	Soil	1	G	✓	
	545B40C		15:30	Soil	1	G	✓	
	545B39A		15:35	Soil	1	G	✓	
	545B39B		15:40	Soil	1	G	✓	
	545B39C		15:45	Soil	1	G	✓	
	545B42A		16:00	Soil	1	G	✓	

(5)

	Date	Time	Received By:
Collected/Relinquished By:(1)	1/9/07	1730	
Relinquished By: (2)	1/10/07	0950	Amy DeLaney
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 3.4

Special Deliverable Requirements:

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

8

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination	n	Failed Signal to noise ratio		

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-347 **Fraction:** Dioxin/Furans

Lab: Paradigm Analytical **Project Name** Radford SWMU 54

Reviewer: RA **Date:** February 27, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The method blanks displayed positive detections for OCDD, 2,3,7,8-TCDF, 2,3,4,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,4,6,7,8-HpCDF, OCDF, total HpCDDs, total TCDFs, total PeCDFs, total HxCDFs, and total HpCDFs. Positive associated field sample results less than ten times the method blank concentrations for OCDD and OCDF, and less than five times the method blank concentrations for the other affected compounds were flagged "B,z".

The field duplicate pair 54SB78B/DUP-3 displayed a relative percent difference greater than the control limit of 50% for total TCDFs at 65.3%. These results were flagged "J,f" in these samples.

Several samples displayed detections reported by the laboratory as estimated maximum possible concentrations (EMPCs). In cases where the EMPC displayed an ion abundance ratio outside the method criterion of a theoretical ratio +/- 15% but within the EPA Region III criterion of +/- 25%, the EMPC was qualified as "J,w". In cases where the EMPC displayed an ion abundance ratio greater than the EPA Region III criterion of +/- 25%, the EMPC was changed to a non-detect.

Correctable Anomalies: The letter S in the sample IDs was reported as 5 by the laboratory. For example, sample 54SB50A was reported as 545B50A. These were manually corrected on the result forms by the reviewer.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Rayan

Paradigm Analytical Laboratories

Cust Proj ID: SWMU 54 RFI
Client Name: URS

G296-347

Due Date: 2007-01-31 17:00:00
Login Date: 2007-01-11 08:30:38

DUPS

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G296-347-1	A	Dup-3	STD	2007-01-09 00:00:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-2	A	545B50A	STD	2007-01-09 12:50:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-3	A	545B78A	STD	2007-01-09 11:35:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-4	A	545B78B	STD	2007-01-09 11:38:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-5	A	545B47C	STD	2007-01-09 11:33:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-6	A	545B47B	STD	2007-01-09 11:23:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-7	A	545B47A	STD	2007-01-09 11:13:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-8	A	545B54A	STD	2007-01-09 09:55:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-9	A	545B54A MS	STD	2007-01-09 09:55:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-10	A	545B54A MSD	STD	2007-01-09 09:55:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-11	A	545B53C	STD	2007-01-09 11:10:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-12	A	545B53B	STD	2007-01-09 11:00:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-13	A	545B41A	STD	2007-01-09 08:50:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-14	A	545B80C	STD	2007-01-09 13:21:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-15	A	545B80B	STD	2007-01-09 13:17:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-16	A	545B79C	STD	2007-01-09 15:00:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-17	A	545B80A	STD	2007-01-09 13:10:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-18	A	545B79A	STD	2007-01-09 14:40:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-19	A	545B50C	STD	2007-01-09 13:05:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-20	A	545B50B	STD	2007-01-09 13:00:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-21	A	545B79B	STD	2007-01-09 14:50:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW
G296-347-22	A	545B78C	STD	2007-01-09 11:40:00	2007-01-10	2007-01-31	Soil	W2	Full	8290	LG::REVW

VS

RA
2/26/07

8

01/11/2007

Method 8290
Dup-3
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0994					
1,2,3,7,8-PeCDD	ND	0.493					
1,2,3,4,7,8-HxCDD	ND	0.493					
1,2,3,6,7,8-HxCDD	ND	0.493					
1,2,3,7,8,9-HxCDD	ND	0.493					
1,2,3,4,6,7,8-HpCDD	1.62			39.94	1.09		A
OCDD	48.9			44.08	0.91		
2,3,7,8-TCDF	0.276			30.22	0.78		A
1,2,3,7,8-PeCDF	ND	0.493					
2,3,4,7,8-PeCDF	1 EMPC 2 ND ~~EMPC~~	0.493	0.0848 J,W	33.83	1.23	*	A
1,2,3,4,7,8-HxCDF		0.493	~~0.0355 e~~	35.87	1.83	*	A
1,2,3,6,7,8-HxCDF	ND	0.493					
2,3,4,6,7,8-HxCDF	ND	0.493					
1,2,3,7,8,9-HxCDF	ND	0.493					
1,2,3,4,6,7,8-HpCDF	0.181 B,Z			38.69	1.10		A
1,2,3,4,7,8,9-HpCDF	ND	0.493					
OCDF	ND	0.986					
Total TCDDs	ND	0.0994	0.0690				
Total PeCDDs	ND	0.493	0.211				
Total HxCDDs	0.692		0.891				
Total HpCDDs	5.68						
Total TCDFs	0.461 J,F		0.566				
Total PeCDFs	0.0355 B, Z		0.120				
Total HxCDFs	ND	0.493	0.0946				
Total HpCDFs	0.290 B, Z						
WHO-2005 TEQ (ND=0)	0.0603		0.0893				
WHO-2005 TEQ (ND=½)	0.613		0.543				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	Dup-3		Weight / Volume:	12.14 g	
			Solids / Lipids:	83.6	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-1B		Filename:	c26jan07d_5-4	
Collection Date/Time:	01/09/07		Retchk:	c26jan07d_4-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14	
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14	
Analysis Date/Time:	01/28/07	15:19	Initial Cal:	m8290-e110206a	

1 → Ion ratio < 25% → J,W
2 → Ion ratio ≥ 25% → ND

VALUE CHANGE

Method 8290
Dup-3
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.54	77.1	31.05	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.53	76.5	34.01	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.64	81.9	36.67	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.66	83.2	39.92	1.07	
13C12-OCDD	4.0	2.59	64.7	44.07	0.91	
13C12-2,3,7,8-TCDF	2.0	1.95	97.7	30.22	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.62	80.8	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.67	83.7	35.97	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.67	83.7	38.69	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.329	82.2	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.337	84.3	33.81	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.257	64.1	36.58	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.312	77.9	35.87	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.327	81.8	40.57	0.47	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	Dup-3		Weight / Volume:	12.14 g
			Solids / Lipids:	83.6 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-1B		Filename:	c26jan07d_5-4
Collection Date/Time:	01/09/07		Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	15:19	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 05Feb07

Reviewed by:
Date: 7/5/07

S

Method 8290
545B50A
URS

RA 2/26/07

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	1 ~~EMPC~~ ND	0.154	~~0.566~~	31.07	0.56	*	A
1,2,3,7,8-PeCDD	1 ~~EMPC~~ ND	0.580	~~0.244~~	34.01	1.05	*	A
1,2,3,4,7,8-HxCDD	0.311			36.60	1.39		A
1,2,3,6,7,8-HxCDD	0.643			36.69	1.23		A
1,2,3,7,8,9-HxCDD	2 EMPC	0.580	0.821 J,W	36.92	1.45	*	A
1,2,3,4,6,7,8-HpCDD	21.6			39.94	1.05		
OCDD	656			44.09	0.88		
2,3,7,8-TCDF	0.610			30.25	0.80		A
1,2,3,7,8-PeCDF	0.200			33.21	1.71		A
2,3,4,7,8-PeCDF	2 EMPC	0.580	0.306 J,W	33.85	1.26	*	A
1,2,3,4,7,8-HxCDF	0.408			35.90	1.08		A
1,2,3,6,7,8-HxCDF	0.318 B? Z			35.99	1.39		A
2,3,4,6,7,8-HxCDF	2 EMPC	0.580	0.429 J,W	36.47	1.45	*	A
1,2,3,7,8,9-HxCDF	0.123 B? Z			37.25	1.06		A
1,2,3,4,6,7,8-HpCDF	4.16			38.70	1.05		A
1,2,3,4,7,8,9-HpCDF	0.309			40.60	1.05		A
OCDF	8.16			44.38	0.86		A
Total TCDDs	0.206		1.15				
Total PeCDDs	1.59		2.77				
Total HxCDDs	6.11		7.11				
Total HpCDDs	59.7						
Total TCDFs	2.04		2.17				
Total PeCDFs	1.16		2.46				
Total HxCDFs	3.96		4.61				
Total HpCDFs	10.7						
WHO-2005 TEQ (ND=0)	0.707		1.73				
WHO-2005 TEQ (ND=½)	1.22		1.73				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B50A		Weight / Volume:	12.37 g	
			Solids / Lipids:	69.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-2B		Filename:	c26jan07d_5-5	
Collection Date/Time:	01/09/07	12:50	Retchk:	c26jan07d_4-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14	
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14	
Analysis Date/Time:	01/28/07	16:07	Initial Cal:	m8290-c110206a	

1 ion ratio > 25% ND
2 ion ratio < 25%, J,W

VALUE CHANGE

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Method 8290
545B50A RA 2/24/07
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.38	69.2	31.05	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.36	67.8	34.01	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.59	79.3	36.67	1.09	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.51	75.6	39.92	1.06	
13C12-OCDD	4.0	2.49	62.3	44.08	0.88	
13C12-2,3,7,8-TCDF	2.0	1.78	89.1	30.21	0.81	
13C12-1,2,3,7,8-PeCDF	2.0	1.45	72.4	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.50	75.2	35.98	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.51	75.4	38.70	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.323	80.7	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.315	78.8	33.83	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.235	58.7	36.60	1.23	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.330	82.5	35.88	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.317	79.4	40.58	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.82	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B50A		Weight / Volume:	12.37 g
			Solids / Lipids:	69.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-2B		Filename:	c26jan07d_5-5
Collection Date/Time:	01/09/07	12:50	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	16:07	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: LMP
Date: 05Feb07

Reviewed by: CRV
Date: 2/5/07

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Method 8290
545B78A
URS

R.A.

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	1.76			31.07	0.78		
1,2,3,7,8-PeCDD	ND	0.468					
1,2,3,4,7,8-HxCDD	0.159			36.61	1.09		A
1,2,3,6,7,8-HxCDD	0.271			36.67	1.20		A
1,2,3,7,8,9-HxCDD	ND EMPC 1	0.468	~~0.200~~	36.93	0.83	*	A
1,2,3,4,6,7,8-HpCDD	5.50			39.94	1.08		
OCDD	109			44.09	0.89		
2,3,7,8-TCDF	0.500			30.23	0.86		A
1,2,3,7,8-PeCDF	0.140			33.21	1.49		A
2,3,4,7,8-PeCDF	0.212 B,Z			33.84	1.50		A
1,2,3,4,7,8-HxCDF	ND EMPC	0.468	~~0.148~~	35.88	0.64	*	A
1,2,3,6,7,8-HxCDF	ND EMPC	0.468	~~0.110~~	36.00	1.61	*	A
2,3,4,6,7,8-HxCDF	ND EMPC	0.468	~~0.170~~	36.47	1.88	*	A
1,2,3,7,8,9-HxCDF	ND	0.468					
1,2,3,4,6,7,8-HpCDF	1.08			38.72	1.15		A
1,2,3,4,7,8,9-HpCDF	ND	0.468					
OCDF	1.25 B,Z			44.38	0.93		A
Total TCDDs	1.76		2.03				
Total PeCDDs	0.440		0.945				
Total HxCDDs	2.86		3.40				
Total HpCDDs	17.6						
Total TCDFs	1.83		2.24				
Total PeCDFs	0.964		1.56				
Total HxCDFs	0.388 B,Z		1.48				
Total HpCDFs	1.94						
WHO-2005 TEQ (ND=0)	2.02		2.08				
WHO-2005 TEQ (ND=½)	2.37		2.34				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B78A		Weight / Volume:	13.35 g	
			Solids / Lipids:	80.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-3B		Filename:	c26jan07d_5-6	
Collection Date/Time:	01/09/07	11:35	Retchk:	c26jan07d_4-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14	
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14	
Analysis Date/Time:	01/28/07	16:56	Initial Cal:	m8290-c110206a	

1 ion ratio 72%.

VALUE CHANGE

Method 8290
545B78A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.56	77.8	31.05	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.54	76.8	34.01	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.69	84.4	36.67	1.28	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.73	86.7	39.92	1.02	
13C12-OCDD	4.0	2.76	69.0	44.08	0.90	
13C12-2,3,7,8-TCDF	2.0	1.98	98.8	30.22	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.61	80.3	33.21	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.70	85.1	35.98	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.76	87.8	38.69	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.331	82.6	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.322	80.6	33.83	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.248	62.0	36.60	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.344	86.0	35.88	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.334	83.5	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.31	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B78A		Weight / Volume:	13.35 g
			Solids / Lipids:	80.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-3B		Filename:	c26jan07d_5-6
Collection Date/Time:	01/09/07	11:35	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	16:56	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: JW
Date: 02-05-07

Reviewed by: [signature]
Date: 2/5/07

S RA

Method 8290
545B78B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.103					
1,2,3,7,8-PeCDD	ND	0.471					
1,2,3,4,7,8-HxCDD	ND	0.471					
1,2,3,6,7,8-HxCDD	ND	0.471					
1,2,3,7,8,9-HxCDD	ND	0.471					
1,2,3,4,6,7,8-HpCDD	1.22			39.91	1.00		A
OCDD	34.7			44.08	0.93		
2,3,7,8-TCDF	ND ~~EMPC~~	0.104	~~0.255~~	30.21	0.51	*	A
1,2,3,7,8-PeCDF	ND	0.471					
2,3,4,7,8-PeCDF	ND	0.471					
1,2,3,4,7,8-HxCDF	ND	0.471					
1,2,3,6,7,8-HxCDF	ND	0.471					
2,3,4,6,7,8-HxCDF	ND	0.471					
1,2,3,7,8,9-HxCDF	ND	0.471					
1,2,3,4,6,7,8-HpCDF	ND	0.471					
1,2,3,4,7,8,9-HpCDF	ND	0.471					
OCDF	ND ~~EMPC~~	0.943	~~0.272~~	44.38	0.62	*	A
Total TCDDs	ND	0.103					
Total PeCDDs	ND	0.471					
Total HxCDDs	0.504						
Total HpCDDs	4.05						
Total TCDFs	0.234 JF		0.488				
Total PeCDFs	ND	0.471					
Total HxCDFs	ND	0.471	0.0434				
Total HpCDFs	0.164 BJF						
WHO-2005 TEQ (ND=0)	0.0226		0.0482				
WHO-2005 TEQ (ND=½)	0.562		0.583				

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B78B		Weight / Volume:	12.75 g
			Solids / Lipids:	83.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-4B		Filename:	c26jan07d_5-7
Collection Date/Time:	01/09/07	11:38	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	17:44	Initial Cal:	m8290-c110206a

* ion ratio 725% → NDs

VALUE CHANGE

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Method 8290 R.A.
545B78B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.26	62.8	31.03	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.25	62.4	34.00	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.40	69.9	36.66	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.37	68.6	39.91	1.06	
13C12-OCDD	4.0	2.15	53.7	44.07	0.89	
13C12-2,3,7,8-TCDF	2.0	1.62	81.1	30.21	0.82	
13C12-1,2,3,7,8-PeCDF	2.0	1.32	65.8	33.19	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.37	68.6	35.96	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.39	69.3	38.68	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.317	79.2	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.321	80.3	33.81	1.65	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.291	72.7	36.58	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.331	82.7	35.87	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.322	80.6	40.56	0.48	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.42	0.82	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.26	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B78B		Weight / Volume:	12.75 g
			Solids / Lipids:	83.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-4B		Filename:	c26jan07d_5-7
Collection Date/Time:	01/09/07	11:38	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	17:44	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 12Feb07

Reviewed by: GPV
Date: 2/13/07

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Method 8290
545B47C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.112					
1,2,3,7,8-PeCDD	0.0922			34.03	1.43		A
1,2,3,4,7,8-HxCDD	ND	0.461					
1,2,3,6,7,8-HxCDD	ND	0.461					
1,2,3,7,8,9-HxCDD	ND	0.461					
1,2,3,4,6,7,8-HpCDD	1.50			39.92	0.99		A
OCDD	59.2			44.08	0.89		
2,3,7,8-TCDF	0.247			30.22	0.80		A
1,2,3,7,8-PeCDF	EMPC	0.461	0.0627 J,W	33.19	1.26	*	A
2,3,4,7,8-PeCDF	EMPC	0.461	0.120 J,W	33.83	1.17	*	A
1,2,3,4,7,8-HxCDF	ND	0.461					
1,2,3,6,7,8-HxCDF	EMPC	0.461	0.0442 J,W	35.97	1.02	*	A
2,3,4,6,7,8-HxCDF	EMPC	0.461	0.133 J,W	36.47	0.95	*	A
1,2,3,7,8,9-HxCDF	ND	0.461					
1,2,3,4,6,7,8-HpCDF	0.170 B,Z			38.70	0.98		A
1,2,3,4,7,8,9-HpCDF	ND	0.461					
OCDF	ND	0.922					
Total TCDDs	ND	0.112					
Total PeCDDs	0.907						
Total HxCDDs	0.182		0.549				
Total HpCDDs	4.98						
Total TCDFs	0.507		0.968				
Total PeCDFs	0.306 B,Z		0.791				
Total HxCDFs	0.280 B,Z		0.457				
Total HpCDFs	0.170 B,Z		0.267				
WHO-2005 TEQ (ND=0)	0.151		0.207				
WHO-2005 TEQ (ND=½)	0.447		0.381				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B47C		Weight / Volume:	12.55 g	
			Solids / Lipids:	86.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-5B		Filename:	c26jan07d_5-8	
Collection Date/Time:	01/09/07	11:33	Retchk:	c26jan07d_4-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14	
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14	
Analysis Date/Time:	01/28/07	18:32	Initial Cal:	m8290-c110206a	

* ion ratio <25% → J,W

S R.A.

Method 8290
545B47C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.52	76.0	31.03	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.50	74.9	34.00	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.64	82.2	36.66	1.23	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.71	85.3	39.91	1.07	
13C12-OCDD	4.0	2.65	66.1	44.07	0.91	
13C12-2,3,7,8-TCDF	2.0	1.95	97.3	30.19	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.58	78.9	33.20	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.65	82.4	35.97	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.71	85.7	38.68	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.321	80.1	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.320	79.9	33.81	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.248	62.0	36.58	1.23	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.295	73.8	35.87	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.325	81.3	40.56	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.42	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.19	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B47C		Weight / Volume:	12.55 g
			Solids / Lipids:	86.5 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-5B		Filename:	c26jan07d_5-8
Collection Date/Time:	01/09/07	11:33	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	18:32	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 05Feb07

Reviewed by: MD
Date: 2/5/07

Method 8290
545B47B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0954					
1,2,3,7,8-PeCDD	ND	0.477					
1,2,3,4,7,8-HxCDD	ND	0.477					
1,2,3,6,7,8-HxCDD	ND	0.477					
1,2,3,7,8,9-HxCDD	ND	0.477					
1,2,3,4,6,7,8-HpCDD	1.71			39.91	1.11		A
OCDD	78.3			44.08	0.88		
2,3,7,8-TCDF	~~EMPC~~ ND 1	0.115	~~0.235~~	30.19	1.20	*	A
1,2,3,7,8-PeCDF	ND	0.477					
2,3,4,7,8-PeCDF	ND	0.477					
1,2,3,4,7,8-HxCDF	0.0592			35.90	1.33		A
1,2,3,6,7,8-HxCDF	ND	0.477					
2,3,4,6,7,8-HxCDF	~~EMPC~~ ND 1	0.477	~~0.0973~~	36.46	0.89	*	A
1,2,3,7,8,9-HxCDF	ND	0.477					
1,2,3,4,6,7,8-HpCDF	EMPC	0.477	0.225 J,W 2	38.68	0.85	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.477					
OCDF	~~EMPC~~ ND 1	0.954	~~0.227~~	44.37	0.68	*	A
Total TCDDs	ND	0.0954					
Total PeCDDs	ND	0.477					
Total HxCDDs	0.210		0.405				
Total HpCDDs	5.63						
Total TCDFs	ND	0.115	0.471				
Total PeCDFs	ND	0.477	0.183				
Total HxCDFs	0.594 B,J	Z	0.783				
Total HpCDFs	ND	0.477	0.428				
WHO-2005 TEQ (ND=0)	0.0465		0.0821				
WHO-2005 TEQ (ND=½)	0.565		0.569				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B47B		Weight / Volume:	12.73 g	
			Solids / Lipids:	82.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-6B		Filename:	c26jan07d_5-9	
Collection Date/Time:	01/09/07	11:23	Retchk:	c26jan07d_4-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14	
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14	
Analysis Date/Time:	01/28/07	19:20	Initial Cal:	m8290-c110206a	

1 → ion ratio 725% / ND
2 → ion ratio <25% / J,W

VALUE CHANGE

Method 8290
545B47B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.46	73.0	31.03	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.47	73.7	34.00	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.63	81.5	36.67	1.31	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.68	84.1	39.91	1.06	
13C12-OCDD	4.0	2.59	64.8	44.07	0.91	
13C12-2,3,7,8-TCDF	2.0	1.89	94.7	30.19	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.56	78.0	33.20	1.61	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.63	81.5	35.97	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.68	83.9	38.69	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.331	82.8	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.329	82.1	33.81	1.65	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.281	70.3	36.58	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.321	80.2	35.87	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.335	83.8	40.57	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.34	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B47B		Weight / Volume:	12.73 g
			Solids / Lipids:	82.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-6B		Filename:	c26jan07d_5-9
Collection Date/Time:	01/09/07	11:23	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	19:20	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 05Feb07

Reviewed by: CM
Date: 2/5/07

S R-A

Method 8290
545B47A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.101					
1,2,3,7,8-PeCDD	ND ~~EMPC~~ *	0.506	~~0.221~~	34:10	0.78	*	Q A
1,2,3,4,7,8-HxCDD	0.281			36:46	1.12		A
1,2,3,6,7,8-HxCDD	0.423			36:51	1.29		A
1,2,3,7,8,9-HxCDD	0.747			37:04	1.32		A
1,2,3,4,6,7,8-HpCDD	24.8			40:09	1.03		
OCDD	2440			44:22	0.89		
2,3,7,8-TCDF	0.293			30:40	0.70		A
1,2,3,7,8-PeCDF	0.105			33:22	1.55		A
2,3,4,7,8-PeCDF	0.152 B,Z			33:58	1.44		Q A
1,2,3,4,7,8-HxCDF	ND ~~EMPC~~ *	0.506	~~0.136~~	36:03	0.86	*	A
1,2,3,6,7,8-HxCDF	0.123 B,Z			36:09	1.20		A
2,3,4,6,7,8-HxCDF	0.168 B,Z			36:37	1.41		A
1,2,3,7,8,9-HxCDF	ND	0.506					
1,2,3,4,6,7,8-HpCDF	0.937			38:52	1.00		A
1,2,3,4,7,8,9-HpCDF	ND	0.506					
OCDF	1.36 B,Z			44:40	0.90		A
Total TCDDs	ND	0.101					
Total PeCDDs	1.20		1.42				Q
Total HxCDDs	6.54		7.01				
Total HpCDDs	61.0						
Total TCDFs	1.27		1.55				
Total PeCDFs	1.63						Q
Total HxCDFs	1.64		1.77				
Total HpCDFs	1.69						
WHO-2005 TEQ (ND=0)	1.24		1.48				
WHO-2005 TEQ (ND=½)	1.60		1.56				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B47A		Weight / Volume:	13.27 g	
			Solids / Lipids:	74.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS1	
Sample ID:	G296-347-7B		Filename:	a29jan07a_2-13	
Collection Date/Time:	01/09/07	11:13	Retchk:	a29jan07a-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	a29jan07a-15	
Extraction Date:	01/23/07		End ConCal:	a29jan07a_2-14	
Analysis Date/Time:	01/30/07	11:37	Initial Cal:	m8290-071006e	

* → Ion ratio 75% ; ND

VALUE CHANGE

13 R-A

Method 8290
545B47A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.63	81.7	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.11	55.4	34:09	1.58	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.76	88.1	36:51	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.69	84.5	40:07	1.06	
13C12-OCDD	4.0	3.18	79.4	44:22	0.90	
13C12-2,3,7,8-TCDF	2.0	2.04	102	30:40	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.69	84.7	33:21	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.96	97.8	36:07	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.92	96.2	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.363	90.8	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.270	67.6	33:58	1.59	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.371	92.7	36:45	1.36	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.419	105	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.358	89.5	40:48	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.26	

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B47A		Weight / Volume:	13.27 g	
			Solids / Lipids:	74.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS1	
Sample ID:	G296-347-7B		Filename:	a29jan07a_2-13	
Collection Date/Time:	01/09/07	11:13	Retchk:	a29jan07a-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	a29jan07a-15	
Extraction Date:	01/23/07		End ConCal:	a29jan07a_2-14	
Analysis Date/Time:	01/30/07	11:37	Initial Cal:	m8290-071006e	

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02-05-07

Reviewed by: GRD
Date: 2/5/07

Method 8290
545B54A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.0981				
1,2,3,7,8-PeCDD	ND	0.490				
1,2,3,4,7,8-HxCDD	ND	0.490				
1,2,3,6,7,8-HxCDD	ND	0.490				
1,2,3,7,8,9-HxCDD	ND	0.490				
1,2,3,4,6,7,8-HpCDD	1.54			39.96	1.16	A
OCDD	41.1			44.09	0.98	
2,3,7,8-TCDF	0.251			30.25	0.74	A
1,2,3,7,8-PeCDF	ND	0.490				
2,3,4,7,8-PeCDF	0.0667 B, Z			33.84	1.65	A
1,2,3,4,7,8-HxCDF	ND	0.490				
1,2,3,6,7,8-HxCDF	ND	0.490				
2,3,4,6,7,8-HxCDF	ND	0.490				
1,2,3,7,8,9-HxCDF	ND	0.490				
1,2,3,4,6,7,8-HpCDF	0.151 B, Z			38.69	1.08	A
1,2,3,4,7,8,9-HpCDF	ND	0.490				
OCDF	ND	0.981				
Total TCDDs	ND	0.0981				
Total PeCDDs	ND	0.490	0.157			
Total HxCDDs	0.637		0.867			
Total HpCDDs	4.88					
Total TCDFs	0.416		0.506			
Total PeCDFs	0.0667 B, Z					
Total HxCDFs	ND	0.490				
Total HpCDFs	0.151 B, Z					
WHO-2005 TEQ (ND=0)	0.0743		0.0743			
WHO-2005 TEQ (ND=½)	0.550		0.550			

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B54A		Weight / Volume:	12.11 g
			Solids / Lipids:	84.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-8B		Filename:	c26jan07d_3-11
Collection Date/Time:	01/09/07	9:55	Retchk:	c26jan07d_2-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_3-14
Analysis Date/Time:	01/27/07	22:11	Initial Cal:	m8290-c110206a

SR-A

Method 8290
545B54A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.40	69.9	31.05	0.81	
13C12-1,2,3,7,8-PeCDD	2.0	1.46	72.8	34.01	1.64	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.57	78.3	36.69	1.31	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.74	87.0	39.93	1.08	
13C12-OCDD	4.0	2.76	69.0	44.08	0.92	
13C12-2,3,7,8-TCDF	2.0	1.87	93.6	30.22	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.55	77.4	33.21	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.65	82.6	35.98	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.76	87.8	38.70	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.320	80.1	31.07	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.326	81.5	33.83	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.272	67.9	36.60	1.32	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.334	83.4	35.88	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.357	89.3	40.58	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.39	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B54A		Weight / Volume:	12.11 g
			Solids / Lipids:	84.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-8B		Filename:	c26jan07d_3-11
Collection Date/Time:	01/09/07	9:55	Retchk:	c26jan07d_2-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_2-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_3-14
Analysis Date/Time:	01/27/07	22:11	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02.05.07

Reviewed by: CMC
Date: 2/5/07

S.R.A.

Method 8290
545B53C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0932					
1,2,3,7,8-PeCDD	ND	0.466					Q
1,2,3,4,7,8-HxCDD	ND	0.466					
1,2,3,6,7,8-HxCDD	ND	0.466					
1,2,3,7,8,9-HxCDD	ND	0.466					
1,2,3,4,6,7,8-HpCDD	1.93			40:09	1.03		A
OCDD	83.9			44:22	0.89		
2,3,7,8-TCDF	ND EMPC [1,2]	0.0932	0.272 J,W	30:40	0.90	*	A
1,2,3,7,8-PeCDF	~~EMPC~~	0.466	~~0.0578~~	33:22	1.10	*	A
2,3,4,7,8-PeCDF	0.0690 B,Z			33:58	1.32		Q A
1,2,3,4,7,8-HxCDF	ND	0.466					
1,2,3,6,7,8-HxCDF	ND	0.466					
2,3,4,6,7,8-HxCDF	ND	0.466					
1,2,3,7,8,9-HxCDF	ND	0.466					
1,2,3,4,6,7,8-HpCDF	0.155 B,Z			38:52	0.99		A
1,2,3,4,7,8,9-HpCDF	ND	0.466					
OCDF	0.220 B,Z			44:40	1.01		A
Total TCDDs	ND	0.0932					
Total PeCDDs	ND	0.466					Q
Total HxCDDs	0.578						
Total HpCDDs	5.43						
Total TCDFs	0.211		0.587				
Total PeCDFs	0.201 B,Z						Q
Total HxCDFs	0.162 B,Z						
Total HpCDFs	0.282 B,Z						
WHO-2005 TEQ (ND=0)	0.0668		0.0957				
WHO-2005 TEQ (ND=½)	0.524		0.541				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B53C		Weight / Volume:	12.82 g	
			Solids / Lipids:	83.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS1	
Sample ID:	G296-347-11B		Filename:	a29jan07a_2-4	
Collection Date/Time:	01/09/07	11:10	Retchk:	a29jan07a-15	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	a29jan07a-15	
Extraction Date:	01/23/07		End ConCal:	a29jan07a_2-14	
Analysis Date/Time:	01/30/07	4:26	Initial Cal:	m8290-071006e	

1) ion ratio <25%) J,W
2) ion ratio >25%) ND

VALUE CHANGE

SRA

Method 8290
545B53C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.60	80.0	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.30	64.8	34:09	1.58	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.79	89.3	36:49	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.62	80.9	40:07	1.05	
13C12-OCDD	4.0	2.56	64.1	44:22	0.90	
13C12-2,3,7,8-TCDF	2.0	1.99	99.3	30:39	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.64	82.2	33:21	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.90	94.9	36:07	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.79	89.4	38:52	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.357	89.3	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.338	84.5	33:58	1.60	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.354	88.5	36:45	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.416	104	36:01	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.337	84.2	40:48	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B53C		Weight / Volume:	12.82 g
			Solids / Lipids:	83.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS1
Sample ID:	G296-347-11B		Filename:	a29jan07a_2-4
Collection Date/Time:	01/09/07	11:10	Retchk:	a29jan07a-15
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	a29jan07a-15
Extraction Date:	01/23/07		End ConCal:	a29jan07a_2-14
Analysis Date/Time:	01/30/07	4:26	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JW
Date: 02-05-07

Reviewed by: MPL
Date: 2/5/07

S R.A.

Method 8290
545B53B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0872					
1,2,3,7,8-PeCDD	ND	0.436					
1,2,3,4,7,8-HxCDD	ND	0.436					
1,2,3,6,7,8-HxCDD	ND	0.436					
1,2,3,7,8,9-HxCDD	ND	0.436					
1,2,3,4,6,7,8-HpCDD	1.60			39.93	1.08		A
OCDD	86.7			44.08	0.87		
2,3,7,8-TCDF	ND	0.103					
1,2,3,7,8-PeCDF	ND	0.436					
2,3,4,7,8-PeCDF	~~EMPC~~ ND *	0.436	~~0.0471~~	33.80	1.08	*	A
1,2,3,4,7,8-HxCDF	ND	0.436					
1,2,3,6,7,8-HxCDF	ND	0.436					
2,3,4,6,7,8-HxCDF	ND	0.436					
1,2,3,7,8,9-HxCDF	ND	0.436					
1,2,3,4,6,7,8-HpCDF	0.0715 B,Z			38.70	0.89		A
1,2,3,4,7,8,9-HpCDF	ND	0.436					
OCDF	ND	0.872					
Total TCDDs	ND	0.0872	0.672				
Total PeCDDs	ND	0.436					
Total HxCDDs	0.235		0.347				
Total HpCDDs	5.94						
Total TCDFs	ND	0.103	0.169				
Total PeCDFs	ND	0.436	0.0802				
Total HxCDFs	ND	0.436	0.0802				
Total HpCDFs	0.0715 B,Z						
WHO-2005 TEQ (ND=0)	0.0427		0.0569				
WHO-2005 TEQ (ND=½)	0.536		0.485				

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B53B		Weight / Volume:	14.12 g
			Solids / Lipids:	81.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-12B		Filename:	c26jan07d_5-10
Collection Date/Time:	01/09/07	11:00	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	20:09	Initial Cal:	m8290-c110206a

* ion ratio 725%, ND

VALUE CHANGE

S.P.A.

Method 8290
545B53B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.53	76.6	31.05	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.54	76.8	34.00	1.64	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.85	92.7	36.67	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.67	83.7	39.92	1.06	
13C12-OCDD	4.0	2.65	66.2	44.07	0.91	
13C12-2,3,7,8-TCDF	2.0	1.92	96.2	30.21	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.60	79.9	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.61	80.7	35.97	0.55	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.62	81.0	38.69	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.329	82.3	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.329	82.1	33.81	1.64	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.265	66.4	36.60	1.22	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.313	78.4	35.87	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.324	81.1	40.57	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.22	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B53B		Weight / Volume:	14.12 g
			Solids / Lipids:	81.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-12B		Filename:	c26jan07d_5-10
Collection Date/Time:	01/09/07	11:00	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	20:09	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: LMP
Date: 05feb07

Reviewed by: CLL
Date: 2/5/07

S R-A

Method 8290
545B41A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND 1.26			31.06	0.74		
1,2,3,7,8-PeCDD	~~EMPC~~	0.460	~~0.204~~ 1 2	34.04	0.98	*	A
1,2,3,4,7,8-HxCDD	EMPC	0.460	0.291 J1W	36.67	1.48	*	A
1,2,3,6,7,8-HxCDD	ND	0.460					
1,2,3,7,8,9-HxCDD	0.360			36.92	1.12		A
1,2,3,4,6,7,8-HpCDD	10.0			39.94	1.10		
OCDD	440			44.08	0.90		
2,3,7,8-TCDF	ND	0.217					
1,2,3,7,8-PeCDF	EMPC	0.460	0.143 J1W	33.22	1.22	*	A
2,3,4,7,8-PeCDF	0.241 B7Z			33.84	1.55		A
1,2,3,4,7,8-HxCDF	EMPC	0.460	0.154 J1W	35.88	1.50	*	A
1,2,3,6,7,8-HxCDF	EMPC	0.460	0.162 J1W	35.99	1.44	*	A
2,3,4,6,7,8-HxCDF	0.232 B7Z			36.49	1.23		A
1,2,3,7,8,9-HxCDF	ND	0.460					
1,2,3,4,6,7,8-HpCDF	1.01			38.70	1.07		A
1,2,3,4,7,8,9-HpCDF	ND	0.460					
OCDF	ND	0.920					
Total TCDDs	1.26		1.32				
Total PeCDDs	1.16		1.64				
Total HxCDDs	2.78		3.16				
Total HpCDDs	35.1						
Total TCDFs	0.820						
Total PeCDFs	0.791		1.74				
Total HxCDFs	0.868 B7Z		1.36				
Total HpCDFs	1.83						
WHO-2005 TEQ (ND=0)	1.63		1.90				
WHO-2005 TEQ (ND=½)	2.00		1.96				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B41A		Weight / Volume:	12.99 g	
			Solids / Lipids:	83.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-13B		Filename:	c26jan07d_5-11	
Collection Date/Time:	01/09/07	8:50	Retchk:	c26jan07d_4-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14	
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14	
Analysis Date/Time:	01/28/07	20:57	Initial Cal:	m8290-c110206a	

1 → ion ratio 725% ND
2 → ion ratio <29% J1W

VALUE CHANGE

3 RA

Method 8290
545B41A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.52	75.9	31.05	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.53	76.6	34.01	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.89	94.4	36.67	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.71	85.6	39.92	1.04	
13C12-OCDD	4.0	2.83	70.8	44.08	0.89	
13C12-2,3,7,8-TCDF	2.0	1.92	95.9	30.22	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.58	78.9	33.20	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.64	81.8	35.98	0.55	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.71	85.4	38.69	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.320	80.0	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.326	81.5	33.83	1.64	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.265	66.4	36.60	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.306	76.5	35.88	0.55	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.336	84.0	40.57	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.22	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B41A		Weight / Volume:	12.99 g
			Solids / Lipids:	83.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-13B		Filename:	c26jan07d_5-11
Collection Date/Time:	01/09/07	8:50	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	20:57	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 05Feb07

Reviewed by: CMD
Date: 4/5/07

S.A.

Method 8290
545B80C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0958					
1,2,3,7,8-PeCDD	ND	0.467					
1,2,3,4,7,8-HxCDD	ND	0.467					
1,2,3,6,7,8-HxCDD	ND	0.467					
1,2,3,7,8,9-HxCDD	ND	0.467					
1,2,3,4,6,7,8-HpCDD	1.51			39.93	1.17		A
OCDD	64.0			44.07	0.89		
2,3,7,8-TCDF	ND	0.102					
1,2,3,7,8-PeCDF	ND	0.467					
2,3,4,7,8-PeCDF	ND	0.467					
1,2,3,4,7,8-HxCDF	ND	0.467					
1,2,3,6,7,8-HxCDF	ND	0.467					
2,3,4,6,7,8-HxCDF	ND	0.467					
1,2,3,7,8,9-HxCDF	ND	0.467					
1,2,3,4,6,7,8-HpCDF	EMPC	0.467	0.164 J,W	38.69	1.21	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.467					
OCDF	ND	0.934					
Total TCDDs	ND	0.0958					
Total PeCDDs	ND	0.467					
Total HxCDDs	0.202		0.254				
Total HpCDDs	5.32						
Total TCDFs	0.0934		0.332				
Total PeCDFs	0.0336 B? Z						
Total HxCDFs	ND	0.467	0.0523				
Total HpCDFs	ND	0.467	0.222				
WHO-2005 TEQ (ND=0)	0.0343		0.0359				
WHO-2005 TEQ (ND=½)	0.566		0.565				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B80C		Weight / Volume:	13.03 g	
			Solids / Lipids:	82.2	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-14B		Filename:	c26jan07d_5-12	
Collection Date/Time:	01/09/07	13:21	Retchk:	c26jan07d_4-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14	
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14	
Analysis Date/Time:	01/28/07	21:45	Initial Cal:	m8290-c110206a	

* ion ratio (25%) J,W

Method 8290
545B80C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.47	73.6	31.03	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.45	72.6	34.00	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.80	90.0	36.66	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.64	81.9	39.91	1.07	
13C12-OCDD	4.0	2.52	62.9	44.06	0.93	
13C12-2,3,7,8-TCDF	2.0	1.82	91.2	30.19	0.81	
13C12-1,2,3,7,8-PeCDF	2.0	1.51	75.6	33.19	1.61	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.57	78.7	35.97	0.55	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.56	78.0	38.68	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.312	78.0	31.05	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.312	78.1	33.81	1.53	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.248	62.1	36.58	1.24	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.300	75.1	35.87	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.320	80.0	40.57	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.26	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B80C		Weight / Volume:	13.03 g
			Solids / Lipids:	82.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-14B		Filename:	c26jan07d_5-12
Collection Date/Time:	01/09/07	13:21	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	21:45	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 05Feb07

Reviewed by: [illegible]
Date: 2/5/07

Method 8290
545B80B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0964					
1,2,3,7,8-PeCDD	ND	0.482					
1,2,3,4,7,8-HxCDD	ND	0.482					
1,2,3,6,7,8-HxCDD	ND	0.482					
1,2,3,7,8,9-HxCDD	ND ~~EMPC~~	0.482	~~0.110~~	36.91	0.86	*	A
1,2,3,4,6,7,8-HpCDD	3.22			39.93	1.05		A
OCDD	167			44.08	0.89		
2,3,7,8-TCDF	ND	0.0987					
1,2,3,7,8-PeCDF	ND	0.482					
2,3,4,7,8-PeCDF	ND	0.482					
1,2,3,4,7,8-HxCDF	ND ~~EMPC~~	0.482	~~0.0887~~	35.92	3.10	*	A
1,2,3,6,7,8-HxCDF	ND	0.482					
2,3,4,6,7,8-HxCDF	ND EMPC	0.482	~~0.0366~~	36.47	0.35	*	A
1,2,3,7,8,9-HxCDF	ND	0.482					
1,2,3,4,6,7,8-HpCDF	ND	0.482					
1,2,3,4,7,8,9-HpCDF	ND	0.482					
OCDF	ND	0.964					
Total TCDDs	ND	0.0964					
Total PeCDDs	ND	0.482					
Total HxCDDs	0.760		0.960				
Total HpCDDs	10.9						
Total TCDFs	0.193		0.312				
Total PeCDFs	0.0212 B, Z		0.0771				
Total HxCDFs	ND	0.482	0.305				
Total HpCDFs	ND	0.482	0.0752				
WHO-2005 TEQ (ND=0)	0.0823		0.106				
WHO-2005 TEQ (ND=½)	0.630		0.581				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B80B		Weight / Volume:	12.49 g	
			Solids / Lipids:	83.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-15B		Filename:	c26jan07d_5-13	
Collection Date/Time:	01/09/07	13:17	Retchk:	c26jan07d_4-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14	
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14	
Analysis Date/Time:	01/28/07	22:34	Initial Cal:	m8290-c110206a	

* ion ratio 72% / ND

VALUE CHANGE

Method 8290
545B80B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.47	73.3	31.03	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.43	71.5	34.00	1.53	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.52	76.0	36.66	1.28	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.53	76.6	39.91	1.07	
13C12-OCDD	4.0	2.49	62.4	44.06	0.90	
13C12-2,3,7,8-TCDF	2.0	1.77	88.4	30.19	0.81	
13C12-1,2,3,7,8-PeCDF	2.0	1.44	71.9	33.20	1.61	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.48	74.0	35.97	0.51	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.46	72.9	38.68	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.334	83.5	31.05	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.328	82.1	33.81	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.243	60.8	36.58	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.295	73.7	35.87	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.316	79.1	40.57	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B80B		Weight / Volume:	12.49 g
			Solids / Lipids:	83.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-15B		Filename:	c26jan07d_5-13
Collection Date/Time:	01/09/07	13:17	Retchk:	c26jan07d_4-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	22:34	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 02/6/07

Reviewed by: VRL
Date: 2/5/07

Method 8290
545B79C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0962					
1,2,3,7,8-PeCDD	ND	0.479					
1,2,3,4,7,8-HxCDD	ND	0.479					
1,2,3,6,7,8-HxCDD	ND	0.479					
1,2,3,7,8,9-HxCDD	ND	0.479					
1,2,3,4,6,7,8-HpCDD	1.57			39.94	1.01		A
OCDD	45.2			44.08	0.91		
2,3,7,8-TCDF	EMPC	0.0975	0.326 J,W	30.25	0.94	*	A
1,2,3,7,8-PeCDF	ND	0.479					
2,3,4,7,8-PeCDF	ND	0.479					
1,2,3,4,7,8-HxCDF	ND	0.479					
1,2,3,6,7,8-HxCDF	ND	0.479					
2,3,4,6,7,8-HxCDF	ND	0.479					
1,2,3,7,8,9-HxCDF	ND	0.479					
1,2,3,4,6,7,8-HpCDF	EMPC	0.479	0.151 J,W	38.71	1.25	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.479					
OCDF	ND	0.958					
Total TCDDs	ND	0.0962					
Total PeCDDs	ND	0.479					
Total HxCDDs	0.554		0.827				
Total HpCDDs	5.19						
Total TCDFs	0.368		0.739				
Total PeCDFs	0.0172 B,Z		0.0460				
Total HxCDFs	ND	0.479					
Total HpCDFs	0.0958 B,Z		0.247				
WHO-2005 TEQ (ND=0)	0.0293		0.0634				
WHO-2005 TEQ (ND=½)	0.573		0.600				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B79C		Weight / Volume:	12.37 g	
			Solids / Lipids:	84.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-16B		Filename:	c26jan07d_4-7	
Collection Date/Time:	01/09/07	15:00	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/23/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	6:20	Initial Cal:	m8290-c110206a	

* ion ratio <25%. J,W

Method 8290
545B79C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.36	68.0	31.05	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.37	68.7	34.01	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.61	80.5	36.67	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.69	84.4	39.92	1.06	
13C12-OCDD	4.0	2.61	65.3	44.08	0.91	
13C12-2,3,7,8-TCDF	2.0	1.77	88.4	30.21	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.49	74.6	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.69	84.5	35.97	0.56	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.75	87.7	38.69	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.301	75.4	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.316	79.1	33.81	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.252	63.0	36.60	1.23	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.319	79.8	35.87	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.347	86.7	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.23	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B79C		Weight / Volume:	12.37 g
			Solids / Lipids:	84.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-16B		Filename:	c26jan07d_4-7
Collection Date/Time:	01/09/07	15:00	Retchk:	c26jan07d_3-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_4-14
Analysis Date/Time:	01/28/07	6:20	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: JW
Date: 02-05-07

Reviewed by:
Date: 2/5/07

S.C.A.

Method 8290
545B80A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	0.110	0.237 J,W	31.07	0.64	*	A
1,2,3,7,8-PeCDD	ND	0.516					
1,2,3,4,7,8-HxCDD	ND ~~EMPC~~	0.516	~~0.111~~	36.62	1.62	*	A
1,2,3,6,7,8-HxCDD	0.221			36.69	1.18		A
1,2,3,7,8,9-HxCDD	EMPC	0.516	0.213	36.93	0.95	*	A
1,2,3,4,6,7,8-HpCDD	8.82			39.94	1.06		
OCDD	369			44.08	0.91		
2,3,7,8-TCDF	0.706 B,Z			30.25	0.75		A
1,2,3,7,8-PeCDF	ND	0.516					
2,3,4,7,8-PeCDF	EMPC	0.516	0.159 J,W	33.84	1.80	*	A
1,2,3,4,7,8-HxCDF	ND ~~EMPC~~	0.516	~~0.0681~~	35.88	1.57	*	A
1,2,3,6,7,8-HxCDF	0.0867			35.98	1.08		A
2,3,4,6,7,8-HxCDF	EMPC	0.516	0.120 J,W	36.49	1.00	*	A
1,2,3,7,8,9-HxCDF	ND	0.516					
1,2,3,4,6,7,8-HpCDF	0.557			38.69	1.10		A
1,2,3,4,7,8,9-HpCDF	ND	0.516					
OCDF	0.766			44.38	0.80		A
Total TCDDs	0.140		0.378				
Total PeCDDs	0.813						
Total HxCDDs	2.49		3.07				
Total HpCDDs	32.0						
Total TCDFs	1.54 B,Z		1.78				
Total PeCDFs	0.268		0.512				
Total HxCDFs	0.413		0.677				
Total HpCDFs	1.03						
WHO-2005 TEQ (ND=0)	0.306		0.642				
WHO-2005 TEQ (ND=½)	0.836		0.936				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B80A		Weight / Volume:	12.47 g	
			Solids / Lipids:	77.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-17B		Filename:	c26jan07d_4-8	
Collection Date/Time:	01/09/07	13:10	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	7:09	Initial Cal:	m8290-c110206a	

1) ion ratio<25% J,W
2) ion ratio 725%) ND

VALUE CHANGE

Method 8290
545B80A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.51	75.3	31.05	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.54	76.8	34.01	1.53	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.62	81.2	36.67	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.73	86.4	39.92	1.12	
13C12-OCDD	4.0	2.89	72.3	44.07	0.90	
13C12-2,3,7,8-TCDF	2.0	1.99	99.4	30.22	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.67	83.6	33.20	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.69	84.7	35.98	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.80	89.9	38.69	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.331	82.8	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.326	81.4	33.83	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.248	61.9	36.60	1.24	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.307	76.8	35.87	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.348	87.0	40.58	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.32	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B80A		Weight / Volume:	12.47 g
			Solids / Lipids:	77.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-17B		Filename:	c26jan07d_4-8
Collection Date/Time:	01/09/07	13:10	Retchk:	c26jan07d_3-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14
Analysis Date/Time:	01/28/07	7:09	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02.05.07

Reviewed by: MRD
Date: 2/5/07

Method 8290
545B79A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	0.703			31.07	0.79		A
1,2,3,7,8-PeCDD	ND	0.517					
1,2,3,4,7,8-HxCDD	ND	0.517					
1,2,3,6,7,8-HxCDD	EMPC	0.517	0.130 J,W	36.71	1.53	*	A
1,2,3,7,8,9-HxCDD	EMPC	0.517	0.178 J,W	36.92	1.53	*	A
1,2,3,4,6,7,8-HpCDD	2.39			39.94	1.03		A
OCDD	66.3			44.09	0.91		
2,3,7,8-TCDF	0.647 B,Z			30.25	0.76		A
1,2,3,7,8-PeCDF	0.112			33.22	1.35		A
2,3,4,7,8-PeCDF	0.134			33.84	1.56		A
1,2,3,4,7,8-HxCDF	ND	0.517					
1,2,3,6,7,8-HxCDF	ND ~~EMPC~~	0.517	~~0.0786~~	35.99	0.87	*	A
2,3,4,6,7,8-HxCDF	ND	0.517					
1,2,3,7,8,9-HxCDF	ND	0.517					
1,2,3,4,6,7,8-HpCDF	0.335			38.70	1.06		A
1,2,3,4,7,8,9-HpCDF	ND	0.517					
OCDF	0.558			44.39	0.95		A
Total TCDDs	0.703		0.784				
Total PeCDDs	0.939		1.11				
Total HxCDDs	1.37		1.68				
Total HpCDDs	8.05						
Total TCDFs	0.647 B,Z		0.920				
Total PeCDFs	0.306		0.629				
Total HxCDFs	0.283		0.345				
Total HpCDFs	0.689						
WHO-2005 TEQ (ND=0)	0.859		0.897				
WHO-2005 TEQ (ND=½)	1.30		1.26				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B79A		Weight / Volume:	12.09 g	
			Solids / Lipids:	80.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-18B		Filename:	c26jan07d_4-9	
Collection Date/Time:	01/09/07	14:40	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	7:57	Initial Cal:	m8290-c110206a	

1) ion ratio <25%) J,W
2) ion ratio > 25%) ND

VALUE CHANGE

Method 8290
545B79A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.45	72.6	31.05	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.49	74.3	34.01	1.66	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.69	84.4	36.69	1.28	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.77	88.3	39.92	1.07	
13C12-OCDD	4.0	2.76	69.1	44.08	0.91	
13C12-2,3,7,8-TCDF	2.0	1.87	93.4	30.21	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.58	78.9	33.21	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.71	85.3	35.98	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.81	90.7	38.69	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.309	77.4	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.315	78.7	33.83	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.239	59.8	36.60	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.342	85.5	35.88	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.351	87.8	40.58	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.92	1.27	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B79A		Weight / Volume:	12.09 g
			Solids / Lipids:	80.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-18B		Filename:	c26jan07d_4-9
Collection Date/Time:	01/09/07	14:40	Retchk:	c26jan07d_3-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14
Analysis Date/Time:	01/28/07	7:57	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: JWA
Date: 02-05-07

Reviewed by: MPL
Date: 2/5/07

S A

Method 8290
545B50C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0982					
1,2,3,7,8-PeCDD	ND	0.491					
1,2,3,4,7,8-HxCDD	ND	0.491					
1,2,3,6,7,8-HxCDD	ND	0.491					
1,2,3,7,8,9-HxCDD	ND	0.491					
1,2,3,4,6,7,8-HpCDD	1.41			39.93	0.97		A
OCDD	56.6			44.08	0.90		
2,3,7,8-TCDF	0.542 B7Z			30.22	0.83		A
1,2,3,7,8-PeCDF	EMPC	0.491	0.106 J,W	33.21	1.26	*	A
2,3,4,7,8-PeCDF	0.116			33.83	1.38		A
1,2,3,4,7,8-HxCDF	ND	0.491					
1,2,3,6,7,8-HxCDF	0.0668			35.98	1.09		A
2,3,4,6,7,8-HxCDF	ND	0.491					
1,2,3,7,8,9-HxCDF	ND	0.491					
1,2,3,4,6,7,8-HpCDF	0.157			38.68	0.92		A
1,2,3,4,7,8,9-HpCDF	ND	0.491					
OCDF	ND	0.982					
Total TCDDs	ND	0.0982					
Total PeCDDs	ND	0.491	0.189				
Total HxCDDs	0.466		0.674				
Total HpCDDs	5.33						
Total TCDFs	0.914 B7Z		1.01				
Total PeCDFs	0.149		0.348				
Total HxCDFs	0.116						
Total HpCDFs	0.157						
WHO-2005 TEQ (ND=0)	0.128		0.132				
WHO-2005 TEQ (ND=½)	0.580		0.576				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B50C		Weight / Volume:	12.39 g	
			Solids / Lipids:	82.2	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-19B		Filename:	c26jan07d_4-10	
Collection Date/Time:	01/09/07	13:05	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	8:45	Initial Cal:	m8290-c110206a	

* ion ratio <25% J,W

Method 8290
545B50C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.47	73.3	31.03	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.51	75.5	34.00	1.55	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.67	83.3	36.67	1.23	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.72	85.9	39.91	1.03	
13C12-OCDD	4.0	2.77	69.2	44.08	0.92	
13C12-2,3,7,8-TCDF	2.0	1.90	95.2	30.21	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.59	79.7	33.20	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.69	84.3	35.97	0.54	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.71	85.5	38.69	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.314	78.5	31.05	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.322	80.6	33.81	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.299	74.7	36.58	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.348	87.1	35.87	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.343	85.7	40.57	0.47	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.42	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.17	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B50C		Weight / Volume:	12.39 g
			Solids / Lipids:	82.2 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-19B		Filename:	c26jan07d_4-10
Collection Date/Time:	01/09/07	13:05	Retchk:	c26jan07d_3-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14
Analysis Date/Time:	01/28/07	8:45	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 05Feb07

Reviewed by: CAC
Date: 2/5/07

Method 8290
545B50B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.117					
1,2,3,7,8-PeCDD	ND	0.466					
1,2,3,4,7,8-HxCDD	ND	0.466					
1,2,3,6,7,8-HxCDD	ND	0.466					
1,2,3,7,8,9-HxCDD	0.103			36.92	1.17		A
1,2,3,4,6,7,8-HpCDD	2.07			39.92	1.10		A
OCDD	73.1			44.08	0.94		
2,3,7,8-TCDF	0.578 B, Z			30.25	0.75		A
1,2,3,7,8-PeCDF	EMPC	0.466	0.106 J, W	33.21	1.84	*	A
2,3,4,7,8-PeCDF	EMPC	0.466	0.125 J, W	33.83	1.17	*	A
1,2,3,4,7,8-HxCDF	ND	0.466					
1,2,3,6,7,8-HxCDF	ND	0.466					
2,3,4,6,7,8-HxCDF	0.0932			36.47	1.06		A
1,2,3,7,8,9-HxCDF	ND	0.466					
1,2,3,4,6,7,8-HpCDF	0.261			38.70	1.03		A
1,2,3,4,7,8,9-HpCDF	ND	0.466					
OCDF	ND	0.932					
Total TCDDs	ND	0.117	0.729				
Total PeCDDs	0.600		0.813				
Total HxCDDs	0.158		1.03				
Total HpCDDs	6.59						
Total TCDFs	1.04 B, Z						
Total PeCDFs	0.158		0.597				
Total HxCDFs	0.222		0.375				
Total HpCDFs	0.576						
WHO-2005 TEQ (ND=0)	0.123		0.163				
WHO-2005 TEQ (ND=½)	0.610		0.574				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B50B		Weight / Volume:	12.14 g	
			Solids / Lipids:	88.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-20B		Filename:	c26jan07d_4-11	
Collection Date/Time:	01/09/07	13:00	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	9:34	Initial Cal:	m8290-c110206a	

* Ion ratio <25%. J, W

Method 8290
545B50B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.41	70.7	31.05	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.44	72.1	34.00	1.54	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.76	88.0	36.67	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.61	80.6	39.92	1.06	
13C12-OCDD	4.0	2.56	64.0	44.07	0.94	
13C12-2,3,7,8-TCDF	2.0	1.81	90.4	30.21	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.52	75.9	33.20	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.51	75.3	35.97	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.58	79.2	38.69	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.331	82.8	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.328	81.9	33.81	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.279	69.8	36.58	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.319	79.7	35.87	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.337	84.3	40.57	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.42	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.24	

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B50B		Weight / Volume:	12.14	g
			Solids / Lipids:	88.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-20B		Filename:	c26jan07d_4-11	
Collection Date/Time:	01/09/07	13:00	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	9:34	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: JMP
Date: 05Feb07

Reviewed by: [illegible]
Date: 2/5/07

Method 8290
545B79B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0875					
1,2,3,7,8-PeCDD	ND	0.437					
1,2,3,4,7,8-HxCDD	ND	0.437					
1,2,3,6,7,8-HxCDD	ND	0.437					
1,2,3,7,8,9-HxCDD	~~EMPC~~ ND	0.437	~~0.0700~~	36.91	2.09	*	A
1,2,3,4,6,7,8-HpCDD	0.689			39.93	1.11		A
OCDD	18.0 B ~~Z~~			44.09	0.90		
2,3,7,8-TCDF	0.502 B ~~Z~~			30.22	0.80		A
1,2,3,7,8-PeCDF	0.0927			33.21	1.71		A
2,3,4,7,8-PeCDF	~~EMPC~~ ND	0.437	~~0.0962~~	33.84	1.07	*	A
1,2,3,4,7,8-HxCDF	ND	0.437					
1,2,3,6,7,8-HxCDF	ND	0.437					
2,3,4,6,7,8-HxCDF	ND	0.437					
1,2,3,7,8,9-HxCDF	ND	0.437					
1,2,3,4,6,7,8-HpCDF	0.0857			38.72	1.03		A
1,2,3,4,7,8,9-HpCDF	ND	0.437					
OCDF	EMPC	0.875	0.145 J|W	44.35	1.06	*	A
Total TCDDs	ND	0.0875					
Total PeCDDs	ND	0.437	0.467				
Total HxCDDs	0.241		0.453				
Total HpCDDs	2.16						
Total TCDFs	0.593 B ~~Z~~		0.663				
Total PeCDFs	0.275		0.439				
Total HxCDFs	0.0472		0.112				
Total HpCDFs	0.0857						
WHO-2005 TEQ (ND=0)	0.0661		0.102				
WHO-2005 TEQ (ND=½)	0.550		0.498				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B79B		Weight / Volume:	12.79 g	
			Solids / Lipids:	89.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-21B		Filename:	c26jan07d_4-12	
Collection Date/Time:	01/09/07	14:50	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	10:22	Initial Cal:	m8290-c110206a	

1) ion ratio <25%) J|W
2) ion ratio >25%) ND

VALUE CHANGE

Method 8290
545B79B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.43	71.7	31.05	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.45	72.5	34.00	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.61	80.6	36.67	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.72	85.8	39.92	1.06	
13C12-OCDD	4.0	2.68	66.9	44.08	0.89	
13C12-2,3,7,8-TCDF	2.0	1.86	92.9	30.22	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.54	77.1	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.63	81.5	35.97	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.69	84.7	38.69	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.307	76.7	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.321	80.2	33.81	1.66	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.262	65.5	36.60	1.24	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.314	78.6	35.87	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.335	83.9	40.57	0.47	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.44	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.20	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B79B		Weight / Volume:	12.79 g
			Solids / Lipids:	89.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-21B		Filename:	c26jan07d_4-12
Collection Date/Time:	01/09/07	14:50	Retchk:	c26jan07d_3-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14
Analysis Date/Time:	01/28/07	10:22	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 02.05.07

Reviewed by: _____
Date: 2/6/07

Method 8290
545B78C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0927					
1,2,3,7,8-PeCDD	ND	0.463					
1,2,3,4,7,8-HxCDD	ND	0.463					
1,2,3,6,7,8-HxCDD	ND	0.463					
1,2,3,7,8,9-HxCDD	EMPC	0.463	0.211 J,W	36.92	1.50	*	A
1,2,3,4,6,7,8-HpCDD	1.38			39.93	0.96		A
OCDD	38.6			44.08	0.93		
2,3,7,8-TCDF	0.628 B,Z			30.22	0.78		A
1,2,3,7,8-PeCDF	ND ~~EMPC~~	0.463	~~0.0890~~	33.22	1.02	*	A
2,3,4,7,8-PeCDF	0.0871			33.84	1.56		A
1,2,3,4,7,8-HxCDF	ND	0.463					
1,2,3,6,7,8-HxCDF	ND	0.463					
2,3,4,6,7,8-HxCDF	ND	0.463					
1,2,3,7,8,9-HxCDF	ND	0.463					
1,2,3,4,6,7,8-HpCDF	ND ~~EMPC~~	0.463	~~0.135~~	38.70	1.36	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.463					
OCDF	0.171			44.39	1.01		A
Total TCDDs	ND	0.0927					
Total PeCDDs	0.169						
Total HxCDDs	0.751		1.35				
Total HpCDDs	4.57						
Total TCDFs	1.01 B,Z		1.14				
Total PeCDFs	0.133		0.258				
Total HxCDFs	0.0556						
Total HpCDFs	0.106		0.241				
WHO-2005 TEQ (ND=0)	0.114		0.139				
WHO-2005 TEQ (ND=½)	0.566		0.559				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B78C		Weight / Volume:	12.74 g	
			Solids / Lipids:	84.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-347		Instrument:	HRMS3	
Sample ID:	G296-347-22B		Filename:	c26jan07d_4-13	
Collection Date/Time:	01/09/07	11:40	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	11:10	Initial Cal:	m8290-c110206a	

1) ion ratio < 25%) J,W
2) ion ratio > 25%) ND

VALUE CHANGE

Method 8290
545B78C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.46	73.2	31.05	0.80	
13C12-1,2,3,7,8-PeCDD	2.0	1.47	73.3	34.01	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.62	81.1	36.67	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.72	86.1	39.92	1.05	
13C12-OCDD	4.0	2.66	66.4	44.08	0.89	
13C12-2,3,7,8-TCDF	2.0	1.86	93.2	30.22	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.56	77.9	33.20	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.65	82.6	35.98	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.72	85.8	38.69	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.325	81.2	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.320	80.0	33.81	1.57	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.256	63.9	36.60	1.22	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.317	79.2	35.87	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.348	87.1	40.57	0.47	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B78C		Weight / Volume:	12.74 g
			Solids / Lipids:	84.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:	G296-347		Instrument:	HRMS3
Sample ID:	G296-347-22B		Filename:	c26jan07d_4-13
Collection Date/Time:	01/09/07	11:40	Retchk:	c26jan07d_3-14
Receipt Date/Time:	01/10/07	9:50	Begin ConCal:	c26jan07d_3-14
Extraction Date:	01/24/07		End ConCal:	c26jan07d_4-14
Analysis Date/Time:	01/28/07	11:10	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: JMP
Date: 02-05-07

Reviewed by: NRD
Date: 2/5/07

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: RA
Date: 2/7/07
DV Level: II (III) IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002) X NFG Region III Draft Guidance (March 1999)

Project Name: SWMU 54
Project Number: 114563511.30007
Laboratory: SGS
SDG No.: G296-347
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B". (use 10X for OCDD/OCDF data) TEQ values should not be calculated for isomers flagged B.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	✓		✓

Notes: See attached <10x for OCDD, OCDF and <5x for others → B, Z

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-"; by greater than 50%, "J+/R-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "N+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits	
4	M/M+2	0.77	0.65- 0.89	
5	M+2/M+4	1.55	1.32- 1.78	
6	M+2/M+2	1.24	1.05- 1.43	
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	
~~7~~	~~M+2/M+4~~	~~1.04~~	~~0.88- 1.20~~	N/A for APPIX
~~8~~	~~M+2~~	~~0.89~~	~~0.76- 1.02~~	N/A for APPIX

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓		

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed at the same frequency as calibrations that defines descriptor switching times of scan ranges? If not, make a note in DV Report.	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≤ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?		✓	
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?		✓	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	✓		
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		
8.3	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	✓	✓	

Notes: ~~Sample 545B78B Cleanup Std 13C12-1,2,3,4,7,8-HxCDF 7135% at 598% → J/A~~ CA

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.		✓	
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes: 545B76B and Dup-3 RPD

1,2,3,4,6,7,8-HpCDD	1.22	1.62 okv	28%.
OCDD	34.7	48.9	34% okv
2,3,7,8-TCDF	~~EMPC~~ .255	0.276 okv	7.9% ✓
Total HxCDDs	0.504	0.692	31% ✓
Total HpCDDs	4.05	5.68	~~33.8%~~ okv
Total TCDFs	0.461	0.234	65.3% → J, f

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓		
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.	✓		
10.4	Is the signal to noise ≥ 2.5 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥ 2.5 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Are the two identification peak apexs within 2 seconds for positive identifications? If not, result is reported as non-detect,	✓		
10.7	Are polychlorinated diphenyl ether (PCDPE) interferences in the PCDPE channel with a S/N ratio > 2.5 and with a RT within ± 2 seconds? If yes, qualify positive furan results I.	✓		
10.8	Was a second column confirmation used for positive 2,3,7,8-TCDF?	✓		
	If no, apply "R" to the positive 2,3,7,8-TCDF results.			
	If yes, calculate the %D between the two column results, report the lower of the two values if the %D is > 25% and qualify J.			
10.9	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.10	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes:

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
11.1	Are Isotopic ratios for a detected analyte within the following established control limits...?	✓		

# Cl ion atoms	Ion Type	Theoretical	Control Limits	RIII Expanded Limits
4	M/M+2	0.77	0.65- 0.89	0.58- 0.96
5	M+2/M+4	1.55	1.32- 1.78	1.16- 1.94
6	M+2/M+2	1.24	1.05- 1.43	0.93- 1.55
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	0.38- 0.64
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	0.33- 0.55
7	M+2/M+4	1.04	0.88- 1.2	0.78- 1.30
8	M+2	0.89	0.76- 1.02	0.67- 1.11

	For positive field sample results with ion abundance ratios outside the method control limits but within the expanded RIII limits, The laboratory should report the concentration as an estimated maximum possible concentration (EMPC). Region III requires this type of result to be reported as true PCDD/PCDF isomer. The validator shall also qualify J.			
	For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.			
	For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).	✓		
11.2	RIII separates 2,3,7,8-chlorinated isomers from total isomers for each congener group and reports results as 2,3,7,8-chlorine substituted and 'Other Total' PCDD/PCDF isomers. If laboratory did not report these separate, make a note in the DV report.	✓		

Notes: EMPCs were reported.
if ion/ratio <25%, J, UJ
if ion/ratio >25% → ND

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported:			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.100					
1,2,3,7,8-PeCDD	EMPC	0.500	0.106	34.04	1.29	*	A
1,2,3,4,7,8-HxCDD	ND	0.500					
1,2,3,6,7,8-HxCDD	ND	0.500					
1,2,3,7,8,9-HxCDD	EMPC	0.500	0.0720	36.93	1.84	*	A
1,2,3,4,6,7,8-HpCDD	EMPC	0.500	0.332	39.94	1.29	*	A
OCDD	1.35			44.08	0.97		A
2,3,7,8-TCDF	ND	0.100					
1,2,3,7,8-PeCDF	ND	0.500					
2,3,4,7,8-PeCDF	0.0880			33.84	1.76		A
1,2,3,4,7,8-HxCDF	EMPC	0.500	0.0840	35.91	1.57	*	A
1,2,3,6,7,8-HxCDF	0.0880			36.01	1.21		A
2,3,4,6,7,8-HxCDF	0.106			36.47	1.30		A
1,2,3,7,8,9-HxCDF	0.0800			37.24	1.30		A
1,2,3,4,6,7,8-HpCDF	0.182			38.68	1.12		A
1,2,3,4,7,8,9-HpCDF	ND	0.500					
OCDF	0.266			44.38	0.95		A
Total TCDDs	ND	0.100					
Total PeCDDs	ND	0.500	0.106				
Total HxCDDs	ND	0.500	0.134				
Total HpCDDs	0.234		0.566				
Total TCDFs	ND	0.100					
Total PeCDFs	0.118						
Total HxCDFs	0.274		0.358				
Total HpCDFs	0.182						
WHO-2005 TEQ (ND=0)	0.0561		0.181				
WHO-2005 TEQ (ND=½)	0.474		0.296				

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10 g	
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14082	
Project ID:			Instrument:	HRMS3	
Sample ID:			Filename:	c26jan07d_5-3	
Collection Date/Time:			Retchk:	c26jan07d_4-14	
Receipt Date/Time:			Begin ConCal:	c26jan07d_4-14	
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14	
Analysis Date/Time:	01/28/07	14:31	Initial Cal:	m8290-c110206a	

Method 8290
Lab Method Blank

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.50	75.1	31.05	0.80	
13C12-1,2,3,7,8-PeCDD	2.0	1.50	75.1	34.00	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.90	95.2	36.67	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.74	87.2	39.92	1.03	
13C12-OCDD	4.0	2.87	71.7	44.07	0.94	
13C12-2,3,7,8-TCDF	2.0	1.88	93.9	30.21	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.57	78.7	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.68	83.9	35.97	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.70	85.1	38.69	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.320	80.0	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.326	81.4	33.83	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.281	70.4	36.60	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.329	82.1	35.87	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.351	87.9	40.58	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.24	

Client Information			**Sample Information**	
Project Name:			Report Basis:	
			Matrix:	Soil
Sample ID:	Lab Method Blank		Weight / Volume:	10 g
			Solids / Lipids:	NA %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14082
Project ID:			Instrument:	HRMS3
Sample ID:			Filename:	c26jan07d_5-3
Collection Date/Time:			Retchk:	c26jan07d_4-14
Receipt Date/Time:			Begin ConCal:	c26jan07d_4-14
Extraction Date:	01/23/07		End ConCal:	c26jan07d_5-14
Analysis Date/Time:	01/28/07	14:31	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 05Feb07

Reviewed by: MC
Date: 2/6/07

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.341				
1,2,3,7,8-PeCDD	ND	0.500				
1,2,3,4,7,8-HxCDD	ND	0.878				
1,2,3,6,7,8-HxCDD	ND	0.910				
1,2,3,7,8,9-HxCDD	ND	0.887				
1,2,3,4,6,7,8-HpCDD	ND	2.25				
OCDD	3.24			42:42	0.93	A
2,3,7,8-TCDF	0.430			28:51	0.72	A
1,2,3,7,8-PeCDF	ND	0.500				
2,3,4,7,8-PeCDF	ND	0.500				
1,2,3,4,7,8-HxCDF	ND	0.555				
1,2,3,6,7,8-HxCDF	ND	0.531				
2,3,4,6,7,8-HxCDF	ND	0.550				
1,2,3,7,8,9-HxCDF	ND	0.625				
1,2,3,4,6,7,8-HpCDF	ND	0.847				
1,2,3,4,7,8,9-HpCDF	ND	1.05				
OCDF	ND	1.00				
Total TCDDs	ND	0.341				
Total PeCDDs	ND	0.500				
Total HxCDDs	ND	0.910				
Total HpCDDs	ND	2.25				
Total TCDFs	0.704					
Total PeCDFs	ND	0.500				
Total HxCDFs	ND	0.625				
Total HpCDFs	ND	1.05				
WHO-2005 TEQ (ND=0)	0.0440		0.0440			
WHO-2005 TEQ (ND=½)	0.815		0.815			

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10 g	
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:			Instrument:	HRMS1	
Sample ID:			Filename:	a24jan07b_4-3	
Collection Date/Time:			Retchk:	a24jan07b_3-14	
Receipt Date/Time:			Begin ConCal:	a24jan07b_3-14	
Extraction Date:	01/24/07		End ConCal:	a24jan07b_4-14	
Analysis Date/Time:	01/25/07	22:22	Initial Cal:	m8290-071006e	

Method 8290
Lab Method Blank

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.59	79.7	29:45	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.76	88.0	33:19	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.80	89.9	35:49	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	2.08	104	38:51	1.05	
13C12-OCDD	4.0	3.63	90.7	42:40	0.89	
13C12-2,3,7,8-TCDF	2.0	2.02	101	28:49	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.99	99.4	32:34	1.56	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.86	93.2	35:10	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.81	90.4	37:42	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.343	85.9	29:46	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.374	93.4	33:09	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.343	85.8	35:45	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.358	89.6	35:06	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.464	116	39:25	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:01	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:03	1.24	

Client Information			**Sample Information**	
Project Name:			Report Basis:	
			Matrix:	Soil
Sample ID:	Lab Method Blank		Weight / Volume:	10 g
			Solids / Lipids:	NA %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a24jan07b_4-3
Collection Date/Time:			Retchk:	a24jan07b_3-14
Receipt Date/Time:			Begin ConCal:	a24jan07b_3-14
Extraction Date:	01/24/07		End ConCal:	a24jan07b_4-14
Analysis Date/Time:	01/25/07	22:22	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: HMP
Date: 26jan07

Reviewed by: CRC
Date: 1/26/07

all OKV

Method 8290

Results for MS/MSD

545B54A

Analyte	Sample pg/g	Spike pg	MS pg/g	%REC (75-125)	MSD pg/g	%REC (75-125)	%RPD (20)
2,3,7,8-TCDD	ND	200	20.7	108	18.9	108	0.140
1,2,3,7,8-PeCDD	ND	1000	96.0	100	88.4	101	0.990
1,2,3,4,7,8-HxCDD	ND	1000	90.6	94.6	82.7	94.7	0.114
1,2,3,6,7,8-HxCDD	ND	1000	97.1	101	82.6	94.6	6.93
1,2,3,7,8,9-HxCDD	ND	1000	105	110	91.3	105	4.74
1,2,3,4,6,7,8-HpCDD	1.54	1000	95.7	98.3	87.3	98.2	0.107
OCDD	41.1	2000	233	100	216	100	0.0387
2,3,7,8-TCDF	0.251	200	18.5	95.3	16.9	95.3	0.0613
1,2,3,7,8-PeCDF	ND	1000	98.0	102	88.6	101	0.846
2,3,4,7,8-PeCDF	0.0667	1000	91.1	95.0	82.6	94.5	0.565
1,2,3,4,7,8-HxCDF	ND	1000	91.4	95.4	85.8	98.3	2.91
1,2,3,6,7,8-HxCDF	ND	1000	101	105	92.2	106	0.121
2,3,4,6,7,8-HxCDF	ND	1000	94.5	98.7	88.6	101	2.79
1,2,3,7,8,9-HxCDF	ND	1000	92.3	96.4	84.0	96.2	0.185
1,2,3,4,6,7,8-HpCDF	0.151	1000	97.9	102	86.3	98.7	3.39
1,2,3,4,7,8,9-HpCDF	ND	1000	89.6	93.5	79.4	90.9	2.85
OCDF	ND	2000	190	99.2	173	99.1	0.136

Client Information

Project ID:	SWMU 54 RFI
Sample ID:	545B54A

Solids:	84.2	%
Sample amount:	12.1	g
MS amount:	12.4	g
MSD amount:	13.6	g

Laboratory Information

Project ID:	G296-347
Sample ID:	G296-347-8B
MS ID:	G296-347-9B
MSD ID:	G296-347-10B

Reviewed By: _____

all OKV

Analytical Results
for
Ongoing Precision Result (OPR)

Analyte	Spiked (pg/µL)	AMT (pg/µL)	REC %	Range % Lower	Range % Upper	Qualifier
2,3,7,8-TCDD	10	11.1	111	70.0	130	
1,2,3,7,8-PeCDD	50	50.9	102	70.0	130	
1,2,3,4,7,8-HxCDD	50	49.6	99.2	70.0	130	
1,2,3,6,7,8-HxCDD	50	55.7	111	70.0	130	
1,2,3,7,8,9-HxCDD	50	52.7	105	70.0	130	
1,2,3,4,6,7,8-HpCDD	50	53.5	107	70.0	130	
OCDD	100	98.3	98.3	70.0	130	
2,3,7,8-TCDF	10	9.31	93.1	70.0	130	
1,2,3,7,8-PeCDF	50	56.1	112	70.0	130	
2,3,4,7,8-PeCDF	50	52.7	105	70.0	130	
1,2,3,4,7,8-HxCDF	50	51.7	103	70.0	130	
1,2,3,6,7,8-HxCDF	50	53.7	107	70.0	130	
2,3,4,6,7,8-HxCDF	50	51.4	103	70.0	130	
1,2,3,7,8,9-HxCDF	50	51.2	102	70.0	130	
1,2,3,4,6,7,8-HpCDF	50	52.8	106	70.0	130	
1,2,3,4,7,8,9-HpCDF	50	63.3	127	70.0	130	
OCDF	100	103	103	70.0	130	

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Project No:	OPR14084
Extraction Date:	24-Jan-07
Analysis Date:	25-Jan-07
Method:	8290

Sample Information

Matrix:	Soil

File Information

OPR Filename:	a24jan07b_4-1
Retchk:	a24jan07b_3-14
Begin ConCal:	a24jan07b_3-14
End ConCal:	a24jan07b_4-14
Initial Cal:	m8290-071006e

Analytical Results
for
Ongoing Precision Result (OPR)

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2	1.33	66.3	29:46	0.79	
13C12-1,2,3,7,8-PeCDD	2	1.44	72.1	33:19	1.59	
13C12-1,2,3,6,7,8-HxCDD	2	1.46	73.1	35:49	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2	1.63	81.6	38:51	1.06	
13C12-OCDD	4	3.06	76.6	42:40	0.89	
13C12-2,3,7,8-TCDF	2	1.69	84.5	28:49	0.79	
13C12-1,2,3,7,8-PeCDF	2	1.46	72.9	32:34	1.56	
13C12-1,2,3,6,7,8-HxCDF	2	1.54	77.2	35:10	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2	1.51	75.6	37:43	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.288	72.0	29:46	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.312	77.9	33:09	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.265	66.3	35:45	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.316	78.9	35:06	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.396	99.0	39:25	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2	-	-	29:01	0.79	
13C12-1,2,3,7,8,9-HxCDD	2	-	-	36:03	1.26	

QC Information

OPR Project No:	OPR14084
Extraction Date:	24-Jan-07
Analysis Date:	25-Jan-07
Method:	8290

Sample Information

Matrix:	Soil

File Information

OPR Filename :	a24jan07b_4-1
Retchk:	a24jan07b_3-14
Begin ConCal:	a24jan07b_3-14
End ConCal:	a24jan07b_4-14
Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]OPR

Reviewed By: _____ Date Reviewed: 1/26/07

Analytical Results
for
Ongoing Precision & Recovery Duplicate Results (OPRD)

Analyte	Spiked (pg/µL)	AMT (pg/µL)	Recovery %	#	Range Lower	Upper	OPR Rec(%)	#	RPD (±20%)	Qualifier
2,3,7,8-TCDD	10.0	10.9	109		70.0	130	111		1.66	
1,2,3,7,8-PeCDD	50.0	50.1	100		70.0	130	102		1.70	
1,2,3,4,7,8-HxCDD	50.0	51.0	102		70.0	130	99.2		2.77	
1,2,3,6,7,8-HxCDD	50.0	52.2	104		70.0	130	111		6.29	
1,2,3,7,8,9-HxCDD	50.0	51.8	104		70.0	130	105		1.42	
1,2,3,4,6,7,8-HpCDD	50.0	56.5	113		70.0	130	107		5.34	
OCDD	100	98.5	98.5		70.0	130	98.3		0.248	
2,3,7,8-TCDF	10.0	9.31	93.1		70.0	130	93.1		0.0107	
1,2,3,7,8-PeCDF	50.0	54.5	109		70.0	130	112		2.72	
2,3,4,7,8-PeCDF	50.0	52.6	105		70.0	130	105		0.169	
1,2,3,4,7,8-HxCDF	50.0	50.3	101		70.0	130	103		2.49	
1,2,3,6,7,8-HxCDF	50.0	53.4	107		70.0	130	107		0.187	
2,3,4,6,7,8-HxCDF	50.0	51.3	103		70.0	130	103		0.404	
1,2,3,7,8,9-HxCDF	50.0	52.3	105		70.0	130	102		2.50	
1,2,3,4,6,7,8-HpCDF	50.0	52.6	105		70.0	130	106		0.851	
1,2,3,4,7,8,9-HpCDF	50.0	57.8	116		70.0	130	127		9.85	
OCDF	100	103	103		70.0	130	103		0.251	

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Project No:	OPRD14084
Extraction Date:	24-Jan-07
Analysis Date:	25-Jan-07
Method:	8290

Sample Information

Matrix:	Soil

File Information

OPRD Filename :	a24jan07b_4-2
Retchk:	a24jan07b_3-14
Begin ConCal:	a24jan07b_3-14
End ConCal:	a24jan07b_4-14
Initial Cal:	m8290-071006e

Analytical Results
for
Ongoing Precision & Recovery Duplicate Results (OPRD)

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards			(40-135%)			
13C12-2,3,7,8-TCDD	2	1.48	73.8	29:46	0.79	
13C12-1,2,3,7,8-PeCDD	2	1.60	79.8	33:19	1.58	
13C12-1,2,3,6,7,8-HxCDD	2	1.62	80.8	35:49	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2	1.74	87.1	38:51	1.06	
13C12-OCDD	4	3.33	83.2	42:40	0.89	
13C12-2,3,7,8-TCDF	2	1.85	92.4	28:49	0.79	
13C12-1,2,3,7,8-PeCDF	2	1.57	78.4	32:34	1.57	
13C12-1,2,3,6,7,8-HxCDF	2	1.63	81.5	35:10	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2	1.62	80.9	37:43	0.45	
Cleanup Standards			(70-130%)			
37Cl4-2,3,7,8-TCDD	0.4	0.317	79.2	29:46	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.339	84.8	33:09	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.275	68.9	35:45	1.24	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.330	82.5	35:06	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.401	100	39:25	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2	-	-	29:01	0.79	
13C12-1,2,3,7,8,9-HxCDD	2	-	-	36:03	1.24	

QC Information

OPR Project No:	OPRD14084
Extraction Date:	24-Jan-07
Analysis Date:	25-Jan-07
Method:	8290

Sample Information

Matrix:	Soil

File Information

OPRD Filename :	a24jan07b_4-2
Retchk:	a24jan07b_3-14
Begin ConCal:	a24jan07b_3-14
End ConCal:	a24jan07b_4-14
Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]OPRD

Reviewed By: _____ Date Reviewed: 1/24/07

SGS

Case Narrative
SGS Project: **G296-347**
Project Name: **SWMU 54 RFI**

For Method: 8290

- The submitted samples were accepted into the lab on January 10th, 2007 and extracted on January 23rd and January 24th, 2007 by method 3540C. The sample extracts and associated QC extracts were then processed through clean-up by method 3630/3620 and analyzed by HRGC/HRMS for method 8290.

Craig R. Tronzo 2/6/07

Craig R. Tronzo — Date
Data Validation/QA Officer

Secondary Review

Or Heather Patterson 06Feb07

W. Mike Larkins — Date
Technical Director

Heather Patterson — Date
Director

SGS

List of Qualifiers

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* See case narrative

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation generally results in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP[+]
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
[+] Massachusetts Department of Environmental Protection

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(1)

CLIENT: URS

CONTACT: Roshanak Aryan PHONE NO:(907) 965-9000

PROJECT: SWMU 54 RFI SITE/PWSID# :

REPORTS TO: E-MAIL: Roshanak_Aryan@urscorp.com

Roshanak Aryan FAX NO.:( )

INVOICE TO: QUOTE #

P.O. NUMBER

SGS Reference: G296-347

PAGE 1 OF 2

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives Used	Analysis Required (3) Dioxin/Furans	REMARKS
	Dup-3	1/9/07	-	Soil				✓	
	545B 50A		1250					✓	
	545B 78A		1135					✓	
	545B 78B		1138					✓	
	545B 47C		1133					✓	
	545B 47B		1123					✓	
	545B 47A		1113					✓	
	545B54 01(DUP-1)		955					✓	
	545B53C		1110					✓	
	545B53B		1100					✓	

(5)

	Date	Time	
Collected/Relinquished By:(1)	1/9/07	1730	Received By:
Relinquished By: (2)	1/10/07	950	Received By: Amy DeLaney
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 1.5 °F:

Special Deliverable Requirements:

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

❑ 200 W. Potter Drive **Anchorage, AK 99518** Tel: (907) 562-2343 Fax: (907) 561-5301
❑ 5500 Business Drive **Wilmington, NC 28405** Tel: (910) 350-1903 Fax: (910) 350-1557
❑ 1270 Greenbrier Street **Charleston, WV 25311** Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

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- Hawaii
- Maryland
- North Carolina

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(1)

CLIENT: URS

CONTACT: Roshanak Aryan PHONE NO:(804) 965-9000

PROJECT: 11656531 SITE/PWSID#: SWMU 54-RFI

REPORTS TO: E-MAIL: roshanak_aryan@urscorp.com

Roshanak Aryan FAX NO.:(804) 965-9764

INVOICE TO: client QUOTE #

P.O. NUMBER

SGS Reference: G296-347 PAGE 2 OF 2

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (G=COMP, G=GRAB)	Preservatives Used	Analysis Required (3) Diesel Range	REMARKS
	545B41A	1-9-07	850	Soil				✓	
	545B80C		1321					✓	
	545B80B		1317					✓	
	545B79C		1500					✓	
	545B80A		1310					✓	
	545B79A		1440					✓	
	545B50C		1305					✓	
	545B50B		1300					✓	
	545B79B		1450					✓	
	545B78C		1140					✓	

(5)

	Date	Time	Received By:
Collected/Relinquished By:(1)	1/9/07	1770	
Relinquished By: (2)	1/10/07	950	Amy DiLaney
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 1.5 °F

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

7

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **URS** Lab Proj. ID: **G296-347**

Client Proj. ID: **SWMU 54 RFI**

1. X Shipped
   __ Hand Delivered
   Notes:

2. __ Proper, full, and complete documentation
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   X Acceptable documentation (but, incomplete)
   __ Unacceptable documentation
   Notes:

3. X Custody Tape on Container
   __ No Custody Tape
   Notes:

4. X Samples Intact*
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles
   Notes:

5. X Chilled on Receipt* Actual Temp.(s) in °C: 1.5
   __ Ambient on Receipt
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol
   Notes:

6. X Sufficient Sample Submitted
   __ Insufficient Sample Submitted
   Notes:

7. X Samples Preserved Correctly*
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)
   Notes:

8. X Received Within Holding Time
   __ Not Received Within Holding Time
   __ N/A
   Notes:

9. X No Discrepancies Noted
   __ Discrepancies Noted
   Notes:

Comments:

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

DC27.091503.3

Inspected and Logged in by: _____

Date / Time: Thu-1/11/07 08:38

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-348 **Fraction:** PCB Congeners & Dioxin/Furans

Lab: Paradigm Analytical **Project Name** Radford SWMU 54

Reviewer: RA **Date:** March 1, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: For the PCB-Congeners analyses, the method blank displayed positive detections for several congeners. Positive associated equipment blank results less than five times the method blank concentrations were flagged "B,z".

The equipment blank displayed detections for several congeners that were flagged "K" by the laboratory. It was confirmed by the laboratory that these were estimated maximum possible concentrations (EMPCs). These results were previously flagged for method blank contamination except for congener 66. The ion abundance ratio was outside the EPA Region III criterion of +/- 25%, and this result was changed to a non-detect.

For the dioxin-furans analyses, the aqueous and soil method blanks displayed positive detections for several compounds. Positive associated field sample results less than five times the method blank concentrations were flagged "B,z". The equipment blanks also displayed positive detections for several compounds. The associated field sample results were greater than five times the equipment blank concentrations, and no data qualifying action was taken.

Several samples displayed detections reported by the laboratory as EMPCs. In cases where the EMPC displayed an ion abundance ratio outside the method criterion of a theoretical ratio +/- 15% but within the EPA Region III criterion of +/- 25%, the EMPC was qualified as "J,w". In cases where the EMPC displayed an ion abundance ratio greater than the EPA Region III criterion of +/- 25%, the EMPC was changed to a non-detect.

The OCDD result in sample 54SB27A exceeded the calibration range of the instrument and was flagged "E" by the laboratory. This result was flagged "J,q" by the reviewer.

Correctable Anomalies: The letter S in the sample IDs was reported as 5 by the laboratory. For example, sample 54SB27A was reported as 545B27A. These were manually corrected on the result forms by the reviewer.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Rayan

Paradigm Analytical Laboratories

Cust Proj ID: SWMU 54 RFI
Client Name: URS

G296-348

Due Date: 2007-02-01 17:00:00
Login Date: 2007-01-11 16:03:14

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G296-348-1	A	545B27A	STD	2007-01-10 09:36:00	2007-01-11	2007-02-01	Soil	W2	Full	8290	LG::REVW
G296-348-2	A	545B27B	STD	2007-01-10 09:41:00	2007-01-11	2007-02-01	Soil	W2	Full	8290	LG::REVW
G296-348-3	A	545B27C	STD	2007-01-10 09:48:00	2007-01-11	2007-02-01	Soil	W2	Full	8290	LG::REVW
G296-348-4	A	545B34A	STD	2007-01-10 13:40:00	2007-01-11	2007-02-01	Soil	W2	Full	8290	LG::REVW
G296-348-5	A	545B34B	STD	2007-01-10 13:45:00	2007-01-11	2007-02-01	Soil	W2	Full	8290	LG::REVW
G296-348-6	A	545B34C	STD	2007-01-10 13:50:00	2007-01-11	2007-02-01	Soil	W2	Full	8290	LG::REVW
G296-348-7	A	545B58A	STD	2007-01-10 11:17:00	2007-01-11	2007-02-01	Soil	W2	Full	8290	LG::REVW
G296-348-8	A	545B58B	STD	2007-01-10 11:23:00	2007-01-11	2007-02-01	Soil	W2	Full	8290	LG::REVW
G296-348-9	A	545B58C	STD	2007-01-10 11:29:00	2007-01-11	2007-02-01	Soil	W2	Full	8290	LG::REVW
G296-348-10	A	Dup-5	STD	2007-01-10 00:00:00	2007-01-11	2007-02-01	Soil	W2	Full	8290	LG::REVW
G296-348-11	A	EQBK-1	STD	2007-01-10 12:15:00	2007-01-11	2007-02-01	Water	W2	Full	8290	LG::REVW
G296-348-12	A	EQBK-2	STD	2007-01-10 12:20:00	2007-01-11	2007-02-01	Water	W2	Full	1668A	LG::REVW
						2007-02-01	Water	W2	Full	8290	LG::REVW
	B					2007-02-01	Water	W2	Full	1668A	LG::REVW
						2007-02-01	Water	W2	Full	8290	LG::REVW

Results for Selected PCB Congeners by Method 1668A

Client Project ID:
SWMU 54 RFI

Client Sample ID
EQBK-2

Laboratory Information			**Sample Information**		
Lab Project ID:	G296-348		Matrix:	Water	
Lab Sample ID:	G296-348-12D		Amount:	895	mL
Dilution factor:	1		pH:	5	
Collection Date/Time:	10-Jan-07	12:20	Solids/Basis:	NA	/ NA
Receipt Date/Time:	11-Jan-07	10:20	QC Batch ID:	WG14088/14088	
Extraction Date:	25-Jan-07		Filename:	b26jan07a-6	
Analysis Date/Time:	26-Jan-07	17:39	ConCal:	b26jan07a-1	
			RRT Std:	b26jan07a-2	
			Initial Cal:	m1668a-b010906d	

Analyte (Congener#)	Amount (pg/L)	EDL (pg/L)	RL (pg/L)	RT	#	Ratio	#	Qualifier
8-DiCB	ND	11.5	11.2					U
18,30-TrCB	7.08 B,Z	4.48	22.3	12:09		1.26	#	J K
31-TrCB	9.63	3.69	11.2	15:25		0.86	#	J K
20,28-TrCB	9.05 B,Z	3.38	22.3	15:43		1.31	#	J K
37-TrCB	ND	2.70	11.2					U
52-TeCB	26.7 B,Z	8.48	11.2	17:33		0.85		
49,69-TeCB	9.81	7.16	22.3	18:02		0.71		J
44,47,65-TeCB	13.3	7.76	33.5	18:36		0.97	#	J K
61,70,74,(76)-TeCB	19.0 B,Z	3.63	44.7	22:57		0.76		J
66-TeCB	~~7.33~~ ND	3.49	11.2	23:22		0.54	#	~~J K~~ U
56-TeCB	ND	3.66	11.2					U
60-TeCB	ND	3.49	11.2					U
81-TeCB	ND	4.46	11.2					U
77-TeCB	ND	4.34	11.2					U
95-PeCB	25.1 B,Z	7.79	11.2	21:53		1.43		
90,101,113-PeCB	27.2	6.88	33.5	25:29		1.30	#	J K
99-PeCB	10.5	6.57	11.2	26:12		1.57		J
86,87,97,108,119,125-PeCB	14.4 B,Z	6.76	67.0	27:00		1.05	#	J K
123-PeCB	ND	11.1	11.2					U
118-PeCB	14.9 B,Z	10.9	11.2	32:12		1.36		
114-PeCB	ND	11.4	11.2					U
105-PeCB	ND	12.0	11.2					U
126-PeCB	ND	13.7	11.2					U
135,151-HxCB	ND	10.3	22.3					U
132-HxCB	ND	19.7	11.2					U
146-HxCB	ND	16.8	11.2					U
153,168-HxCB	16.0 B,Z	15.7	22.3	34:49		1.24		J
129,138,163-HxCB	15.1 B,Z	17.9	33.5	36:39		1.26		J
158-HxCB	ND	13.0	11.2					U
128,166-HxCB	ND	16.6	22.3					U
167-HxCB	ND	8.04	11.2					U
156,157-HxCB	ND	9.94	22.3					U
169-HxCB	ND	9.99	11.2					U
187-HpCB	ND	7.96	11.2					U
183,185-HpCB	ND	10.0	22.3					U
177-HpCB	ND	11.3	11.2					U
180,193-HpCB	ND	8.90	22.3					U
170-HpCB	ND	11.7	11.2					U
189-HpCB	ND	14.0	11.2					U

DSO

Results for Selected PCB Congeners by Method 1668A

Client Project ID:
SWMU 54 RFI

Client Sample ID
EQBK-2

Analyte (Congener#)	Amount (pg/L)	EDL (pg/L)	RL (pg/L)	RT #	Ratio #	Qualifier
201-OcCB	ND	10.6	11.2			U
196-OcCB	ND	15.4	11.2			U
203-OcCB	ND	13.9	11.2			U
195-OcCB	ND	13.2	11.2			U
194-OcCB	ND	11.9	11.2			U
206-NoCB	ND	8.29	11.2			U
209-DeCB	ND	10.1	11.2			U

Recovery Information

Labeled Standard	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards			(25-150%)			
13C-4-DiCB	2.00	1.16	58.1	8:25	1.59	
13C-15-DiCB	2.00	1.24	61.8	12:59	1.62	
13C-19-TrCB	2.00	1.41	70.4	10:41	1.04	
13C-37-TrCB	2.00	1.15	57.6	19:56	1.03	
13C-54-TeCB	2.00	1.16	58.2	13:13	0.82	
13C-81-TeCB	2.00	0.843	42.1	28:16	0.80	
13C-77-TeCB	2.00	0.878	43.9	29:02	0.78	
13C-104-PeCB	2.00	1.51	75.6	18:31	1.60	
13C-123-PeCB	2.00	1.05	52.3	31:43	1.62	
13C-118-PeCB	2.00	0.971	48.5	32:10	1.58	
13C-114-PeCB	2.00	0.968	48.4	32:55	1.62	
13C-105-PeCB	2.00	1.03	51.3	33:52	1.66	
13C-126-PeCB	2.00	1.03	51.3	38:25	1.65	
13C-155-HxCB	2.00	1.60	80.0	25:06	1.23	
13C-167-HxCB	2.00	1.31	65.4	41:08	1.28	
13C-156,157-HxCB	4.00	2.40	60.1	42:55	1.29	
13C-169-HxCB	2.00	1.23	61.3	47:58	1.31	
13C-188-HpCB	2.00	1.64	82.2	32:49	1.06	
13C-189-HpCB	2.00	1.58	79.0	51:53	1.09	
13C-202-OcCB	2.00	1.54	77.2	40:42	0.92	
13C-205-OcCB	2.00	1.35	67.7	55:58	0.90	
13C-208-NoCB	2.00	1.66	82.8	51:03	0.80	
13C-206-NoCB	2.00	1.62	81.2	58:44	0.82	
13C-209-DeCB	2.00	1.52	76.0	61:16	1.18	
Cleanup Standards			(30-135%)			
13C-28-TrCB	2.00	1.24	62.2	15:42	1.04	
13C-111-PeCB	2.00	1.31	65.6	28:59	1.58	
13C-178-HpCB	2.00	1.44	71.9	37:16	1.06	
Injection Standards						
13C-9-DiCB	2.00			9:48	1.64	
13C-52-TeCB	2.00			17:30	0.78	
13C-101-PeCB	2.00			25:27	1.58	
13C-138-HxCB	2.00			36:38	1.27	
13C-194-OcCB	2.00			55:13	0.93	

Analyzed By: _____
Date: _____

Reviewed By: BRD
Date: 2/9/07

281

SRA 212907

Method 8290
545B27A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.258				
1,2,3,7,8-PeCDD	0.326			34:06	1.46	A
1,2,3,4,7,8-HxCDD	0.523			36:40	1.23	A
1,2,3,6,7,8-HxCDD	1.44			36:45	1.26	A
1,2,3,7,8,9-HxCDD	1.13			37:00	1.32	A
1,2,3,4,6,7,8-HpCDD	69.4			40:03	1.04	
OCDD	4220 J,B			44:13	0.90	E
2,3,7,8-TCDF	0.511 B,Z			30:33	0.87	A
1,2,3,7,8-PeCDF	0.279			33:18	1.46	A
2,3,4,7,8-PeCDF	0.406			33:55	1.45	A
1,2,3,4,7,8-HxCDF	0.513			35:58	1.20	A
1,2,3,6,7,8-HxCDF	0.345			36:04	1.11	A
2,3,4,6,7,8-HxCDF	0.376			36:33	1.16	A
1,2,3,7,8,9-HxCDF	0.151			37:19	1.20	A
1,2,3,4,6,7,8-HpCDF	7.12			38:46	1.06	
1,2,3,4,7,8,9-HpCDF	0.470			40:42	1.11	A
OCDF	23.3			44:31	0.90	
Total TCDDs	ND	0.258				
Total PeCDDs	0.853					
Total HxCDDs	9.73		10.3			
Total HpCDDs	139					
Total TCDFs	1.53 B,Z		2.25			
Total PeCDFs	3.69					
Total HxCDFs	7.50					
Total HpCDFs	22.4					
WHO-2005 TEQ (ND=0)	3.00		3.00			
WHO-2005 TEQ (ND=½)	3.13		3.13			

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B27A		Weight / Volume:	13.23	g
			Solids / Lipids:	84.9	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-348		Instrument:	HRMS1	
Sample ID:	G296-348-1B		Filename:	a03feb07b-9	
Collection Date/Time:	01/10/07	9:36	Retchk:	a03feb07b-1	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a03feb07b-1	
Extraction Date:	01/24/07		End ConCal:	a03feb07b-15	
Analysis Date/Time:	02/04/07	2:15	Initial Cal:	m8290-071006e	

SRA

Method 8290
545B27A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.60	79.8	31:13	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.65	82.6	34:04	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.84	91.8	36:45	1.23	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.67	83.6	40:01	1.05	
13C12-OCDD	4.0	3.90	97.4	44:13	0.89	
13C12-2,3,7,8-TCDF	2.0	1.93	96.6	30:31	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.62	81.0	33:16	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.87	93.4	36:03	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.76	88.1	38:46	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.340	85.0	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.367	91.8	33:54	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.343	85.7	36:40	1.41	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.378	94.5	35:57	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.335	83.6	40:42	0.43	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B27A		Weight / Volume:	13.23 g
			Solids / Lipids:	84.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:	G296-348		Instrument:	HRMS1
Sample ID:	G296-348-1B		Filename:	a03feb07b-9
Collection Date/Time:	01/10/07	9:36	Retchk:	a03feb07b-1
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a03feb07b-1
Extraction Date:	01/24/07		End ConCal:	a03feb07b-15
Analysis Date/Time:	02/04/07	2:15	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02-06-07

Reviewed by: GMW
Date: 2/9/07

Method 8290 R.A
545B27B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.240				
1,2,3,7,8-PeCDD	ND	0.480				
1,2,3,4,7,8-HxCDD	ND	0.480				
1,2,3,6,7,8-HxCDD	ND	0.480				
1,2,3,7,8,9-HxCDD	ND	0.480				
1,2,3,4,6,7,8-HpCDD	3.33			40:03	1.08	A
OCDD	215			44:15	0.89	
2,3,7,8-TCDF	0.363 B/E			30:33	0.86	A
1,2,3,7,8-PeCDF	ND	0.480				
2,3,4,7,8-PeCDF	ND	0.480				
1,2,3,4,7,8-HxCDF	ND	0.480				
1,2,3,6,7,8-HxCDF	ND	0.480				
2,3,4,6,7,8-HxCDF	ND	0.480				
1,2,3,7,8,9-HxCDF	ND	0.480				
1,2,3,4,6,7,8-HpCDF	ND	0.480				
1,2,3,4,7,8,9-HpCDF	ND	0.480				
OCDF	ND	0.961				
Total TCDDs	0.0672		0.165			
Total PeCDDs	ND	0.480				
Total HxCDDs	0.963		1.28			
Total HpCDDs	9.93					
Total TCDFs	0.634 B/E					
Total PeCDFs	ND	0.480	0.0845			
Total HxCDFs	ND	0.480				
Total HpCDFs	ND	0.480				
WHO-2005 TEQ (ND=0)	0.134		0.134			
WHO-2005 TEQ (ND=½)	0.747		0.747			

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B27B		Weight / Volume:	12.34	g
			Solids / Lipids:	84.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-348		Instrument:	HRMS1	
Sample ID:	G296-348-2B		Filename:	a03feb07b-12	
Collection Date/Time:	01/10/07	9:41	Retchk:	a03feb07b-1	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a03feb07b-1	
Extraction Date:	01/24/07		End ConCal:	a03feb07b-15	
Analysis Date/Time:	02/04/07	4:38	Initial Cal:	m8290-071006e	

Method 8290
545B27B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.55	77.3	31:13	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.71	85.3	34:06	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.76	88.2	36:45	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.66	83.0	40:01	1.05	
13C12-OCDD	4.0	3.08	77.0	44:13	0.89	
13C12-2,3,7,8-TCDF	2.0	1.81	90.4	30:31	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.67	83.7	33:18	1.56	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.81	90.6	36:04	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.71	85.6	38:46	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.332	83.0	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.373	93.2	33:54	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.349	87.2	36:40	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.371	92.8	35:57	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.333	83.2	40:42	0.42	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B27B		Weight / Volume:	12.34 g
			Solids / Lipids:	84.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:	G296-348		Instrument:	HRMS1
Sample ID:	G296-348-2B		Filename:	a03feb07b-12
Collection Date/Time:	01/10/07	9:41	Retchk:	a03feb07b-1
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a03feb07b-1
Extraction Date:	01/24/07		End ConCal:	a03feb07b-15
Analysis Date/Time:	02/04/07	4:38	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 2/7/07

Reviewed by: _____
Date: 2/7/07

Method 8290 B R A
545B27C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.0954				
1,2,3,7,8-PeCDD	ND	0.453				
1,2,3,4,7,8-HxCDD	ND	0.453				
1,2,3,6,7,8-HxCDD	ND	0.453				
1,2,3,7,8,9-HxCDD	ND	0.453				
1,2,3,4,6,7,8-HpCDD	1.34			40:03	1.05	A
OCDD	95.4			44:15	0.89	
2,3,7,8-TCDF	0.348 B Z			30:33	0.81	A
1,2,3,7,8-PeCDF	0.0742			33:18	1.51	A
2,3,4,7,8-PeCDF	0.0778			33:55	1.52	A
1,2,3,4,7,8-HxCDF	ND	0.453				
1,2,3,6,7,8-HxCDF	ND	0.453				
2,3,4,6,7,8-HxCDF	ND	0.453				
1,2,3,7,8,9-HxCDF	ND	0.453				
1,2,3,4,6,7,8-HpCDF	ND	0.453				
1,2,3,4,7,8,9-HpCDF	ND	0.453				
OCDF	ND	0.905				
Total TCDDs	ND	0.0954	0.139			
Total PeCDDs	ND	0.453				
Total HxCDDs	0.525					
Total HpCDDs	3.51					
Total TCDFs	0.744 B Z		0.822			
Total PeCDFs	0.228					
Total HxCDFs	ND	0.453				
Total HpCDFs	ND	0.453				
WHO-2005 TEQ (ND=0)	0.102		0.102			
WHO-2005 TEQ (ND=½)	0.539		0.539			

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B27C		Weight / Volume:	13.43	g
			Solids / Lipids:	82.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-348		Instrument:	HRMS1	
Sample ID:	G296-348-3B		Filename:	a03feb07b-13	
Collection Date/Time:	01/10/07	9:48	Retchk:	a03feb07b-1	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a03feb07b-1	
Extraction Date:	01/24/07		End ConCal:	a03feb07b-15	
Analysis Date/Time:	02/04/07	5:26	Initial Cal:	m8290-071006e	

S R.A.

Method 8290
545B27C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.46	72.8	31:13	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.58	79.2	34:06	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.68	84.2	36:45	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.62	81.1	40:01	1.05	
13C12-OCDD	4.0	3.09	77.3	44:13	0.89	
13C12-2,3,7,8-TCDF	2.0	1.75	87.3	30:31	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.55	77.3	33:16	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.72	86.0	36:04	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.68	83.8	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.309	77.1	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.340	84.9	33:54	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.345	86.2	36:40	1.24	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.350	87.6	35:57	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.334	83.5	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B27C		Weight / Volume:	13.43 g
			Solids / Lipids:	82.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:	G296-348		Instrument:	HRMS1
Sample ID:	G296-348-3B		Filename:	a03feb07b-13
Collection Date/Time:	01/10/07	9:48	Retchk:	a03feb07b-1
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a03feb07b-1
Extraction Date:	01/24/07		End ConCal:	a03feb07b-15
Analysis Date/Time:	02/04/07	5:26	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 02-07-07

Reviewed by: _____
Date: 2/7/07

Method 8290
545B34A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0964					
1,2,3,7,8-PeCDD	ND	0.482					
1,2,3,4,7,8-HxCDD	ND	0.482					
1,2,3,6,7,8-HxCDD	ND	0.482					
1,2,3,7,8,9-HxCDD	ND	0.482					
1,2,3,4,6,7,8-HpCDD	1.69			40:03	1.08		A
OCDD	132			44:13	0.89		
2,3,7,8-TCDF	0.345 B,Z			30:33	0.76		A
1,2,3,7,8-PeCDF	0.0656			33:18	1.44		A
2,3,4,7,8-PeCDF	0.0887			33:54	1.49		A
1,2,3,4,7,8-HxCDF	ND	0.482					
1,2,3,6,7,8-HxCDF	ND	0.482					
2,3,4,6,7,8-HxCDF	ND	0.482					
1,2,3,7,8,9-HxCDF	ND	0.482					
1,2,3,4,6,7,8-HpCDF	EMPC	0.482	0.112 J,W	38:46	1.20	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.482					
OCDF	ND	0.964					
Total TCDDs	ND	0.0964	0.172				
Total PeCDDs	0.241						
Total HxCDDs	0.669		0.793				
Total HpCDDs	5.74						
Total TCDFs	0.772 B,Z		0.858				
Total PeCDFs	0.500						
Total HxCDFs	0.125						
Total HpCDFs	ND	0.482	0.112				
WHO-2005 TEQ (ND=0)	0.120		0.121				
WHO-2005 TEQ (ND=½)	0.583		0.581				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B34A		Weight / Volume:	12.35	g
			Solids / Lipids:	84.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:	G296-348		Instrument:	HRMS1	
Sample ID:	G296-348-4B		Filename:	a03feb07b-14	
Collection Date/Time:	01/10/07	13:40	Retchk:	a03feb07b-1	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a03feb07b-1	
Extraction Date:	01/24/07		End ConCal:	a03feb07b-15	
Analysis Date/Time:	02/04/07	6:13	Initial Cal:	m8290-071006e	

Method 8290
545B34A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.39	69.4	31:13	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.47	73.4	34:04	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.61	80.4	36:45	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.57	78.3	40:01	1.05	
13C12-OCDD	4.0	2.95	73.8	44:13	0.90	
13C12-2,3,7,8-TCDF	2.0	1.64	82.0	30:31	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.45	72.3	33:16	1.56	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.63	81.6	36:04	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.59	79.6	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.298	74.4	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.320	79.9	33:54	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.326	81.5	36:40	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.343	85.8	35:57	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.325	81.3	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B34A		Weight / Volume:	12.35 g
			Solids / Lipids:	84.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14084
Project ID:	G296-348		Instrument:	HRMS1
Sample ID:	G296-348-4B		Filename:	a03feb07b-14
Collection Date/Time:	01/10/07	13:40	Retchk:	a03feb07b-1
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a03feb07b-1
Extraction Date:	01/24/07		End ConCal:	a03feb07b-15
Analysis Date/Time:	02/04/07	6:13	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02/5/07

Reviewed by: CRV
Date: 2/7/07

Method 8290 (2.1)
545B34B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0931					
1,2,3,7,8-PeCDD	ND ~~EMPC~~	0.448	~~0.107 e~~	34:10	0.85	*	Q A
1,2,3,4,7,8-HxCDD	0.118			36:45	1.31		A
1,2,3,6,7,8-HxCDD	0.150			36:51	1.24		A
1,2,3,7,8,9-HxCDD	0.269			37:04	1.28		A
1,2,3,4,6,7,8-HpCDD	6.02			40:09	0.96		
OCDD	374			44:22	0.89		
2,3,7,8-TCDF	0.491 B1 Z			30:40	0.75		A
1,2,3,7,8-PeCDF	0.0788 B1 Z			33:22	1.47		A
2,3,4,7,8-PeCDF	EMPC	0.448	0.0913 J1 W	33:58	1.82	*	Q A
1,2,3,4,7,8-HxCDF	ND ~~EMPC~~	0.448	~~0.0519 e~~	36:01	0.75	*	A
1,2,3,6,7,8-HxCDF	ND	0.448					
2,3,4,6,7,8-HxCDF	0.0573			36:37	1.19		A
1,2,3,7,8,9-HxCDF	EMPC	0.448	0.131 J1 W	37:25	1.02	*	A
1,2,3,4,6,7,8-HpCDF	ND ~~EMPC~~	0.448	~~0.215 e~~	38:52	0.74	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.448					
OCDF	0.263			44:40	0.99		A
Total TCDDs	ND	0.0931					
Total PeCDDs	0.285						Q
Total HxCDDs	2.79						
Total HpCDDs	17.4						
Total TCDFs	1.01 B1 Z		1.13				
Total PeCDFs	0.310 B1 Z		0.451				
Total HxCDFs	0.226 B1 Z		0.408				
Total HpCDFs	ND	0.448	0.215				
WHO-2005 TEQ (ND=0)	0.283		0.438				
WHO-2005 TEQ (ND=½)	0.693		0.509				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B34B		Weight / Volume:	14.53	g
			Solids / Lipids:	76.9	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-348		Instrument:	HRMS1	
Sample ID:	G296-348-5B		Filename:	a31jan07a_2-4	
Collection Date/Time:	01/10/07	13:45	Retchk:	a31jan07a-6	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a-6	
Extraction Date:	01/26/07		End ConCal:	a31jan07a_2-14	
Analysis Date/Time:	01/31/07	15:59	Initial Cal:	m8290-071006e	

VALUE CHANGE

S. A.

Method 8290
545B34B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.64	81.9	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.69	84.5	34:09	1.56	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.75	87.6	36:49	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.51	75.3	40:07	1.06	
13C12-OCDD	4.0	2.49	62.2	44:22	0.90	
13C12-2,3,7,8-TCDF	2.0	1.99	99.3	30:39	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.64	81.8	33:21	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.81	90.6	36:07	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.61	80.6	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.359	89.6	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.348	86.9	33:58	1.55	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.370	92.4	36:45	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.380	95.1	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.313	78.3	40:48	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B34B		Weight / Volume:	14.53 g
			Solids / Lipids:	76.9 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-348		Instrument:	HRMS1
Sample ID:	G296-348-5B		Filename:	a31jan07a_2-4
Collection Date/Time:	01/10/07	13:45	Retchk:	a31jan07a-6
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a-6
Extraction Date:	01/26/07		End ConCal:	a31jan07a_2-14
Analysis Date/Time:	01/31/07	15:59	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 02-05-07

Reviewed by: _____
Date: 2/5/07

SRA

Method 8290
545B34C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.111					
1,2,3,7,8-PeCDD	ND	0.554					Q
1,2,3,4,7,8-HxCDD	ND ~~EMPC~~	0.554	~~0.120~~	36:45	1.68	*	A
1,2,3,6,7,8-HxCDD	EMPC	0.554	0.184 JIW	36:49	0.93	*	A
1,2,3,7,8,9-HxCDD	0.284			37:04	1.24		A
1,2,3,4,6,7,8-HpCDD	7.11			40:09	1.02		
OCDD	371			44:22	0.89		
2,3,7,8-TCDF	0.517 BJZ			30:40	0.87		A
1,2,3,7,8-PeCDF	0.0821 BJZ			33:21	1.39		A
2,3,4,7,8-PeCDF	0.115 BJZ			33:58	1.69		Q A
1,2,3,4,7,8-HxCDF	ND	0.554					
1,2,3,6,7,8-HxCDF	ND	0.554					
2,3,4,6,7,8-HxCDF	ND	0.554					
1,2,3,7,8,9-HxCDF	0.160			37:25	1.22		A
1,2,3,4,6,7,8-HpCDF	0.233 BJZ			38:52	1.10		A
1,2,3,4,7,8,9-HpCDF	ND	0.554					
OCDF	ND	1.11					
Total TCDDs	ND	0.111	0.368				
Total PeCDDs	0.370						Q
Total HxCDDs	3.56						
Total HpCDDs	19.9						
Total TCDFs	1.08 BJZ		1.22				
Total PeCDFs	0.197 BJZ						Q
Total HxCDFs	0.353 BJZ						
Total HpCDFs	0.233 BJZ						
WHO-2005 TEQ (ND=0)	0.318		0.348				
WHO-2005 TEQ (ND=½)	0.792		0.767				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B34C		Weight / Volume:	12.05	g
			Solids / Lipids:	74.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-348		Instrument:	HRMS1	
Sample ID:	G296-348-6B		Filename:	a31jan07a_2-5	
Collection Date/Time:	01/10/07	13:50	Retchk:	a31jan07a-6	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a-6	
Extraction Date:	01/26/07		End ConCal:	a31jan07a_2-14	
Analysis Date/Time:	01/31/07	16:47	Initial Cal:	m8290-071006e	

VALUE CHANGE

S R.A.

Method 8290
545B34C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.64	82.2	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.71	85.6	34:09	1.57	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.79	89.5	36:49	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.51	75.4	40:07	1.06	
13C12-OCDD	4.0	2.51	62.6	44:22	0.89	
13C12-2,3,7,8-TCDF	2.0	1.96	98.1	30:40	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.64	81.9	33:21	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.84	91.8	36:07	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.65	82.4	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.362	90.5	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.356	89.0	33:58	1.54	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.374	93.4	36:45	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.405	101	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.316	79.0	40:49	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B34C		Weight / Volume:	12.05 g
			Solids / Lipids:	74.8 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-348		Instrument:	HRMS1
Sample ID:	G296-348-6B		Filename:	a31jan07a_2-5
Collection Date/Time:	01/10/07	13:50	Retchk:	a31jan07a-6
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a-6
Extraction Date:	01/26/07		End ConCal:	a31jan07a_2-14
Analysis Date/Time:	01/31/07	16:47	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JW
Date: 02.05.07

Reviewed by: MD
Date: 2/5/07

SRA

Method 8290
545B58A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	2.13			31:19	0.72		
1,2,3,7,8-PeCDD	ND ~~EMPC~~ e	0.468	~~0.182~~ e	34:10	0.81	*	Q A
1,2,3,4,7,8-HxCDD	0.152			36:45	1.08		A
1,2,3,6,7,8-HxCDD	0.259			36:51	1.14		A
1,2,3,7,8,9-HxCDD	EMPC	0.468	0.333 J,W	37:04	1.49	*	A
1,2,3,4,6,7,8-HpCDD	6.83			40:09	1.09		
OCDD	151			44:22	0.89		
2,3,7,8-TCDF	0.922 B,Z			30:40	0.74		A
1,2,3,7,8-PeCDF	0.172 B,Z			33:21	1.47		A
2,3,4,7,8-PeCDF	0.200 B,Z			33:58	1.59		Q A
1,2,3,4,7,8-HxCDF	0.150			36:01	1.08		A
1,2,3,6,7,8-HxCDF	EMPC	0.468	0.148 J,W	36:09	0.99	*	A
2,3,4,6,7,8-HxCDF	0.135			36:37	1.25		A
1,2,3,7,8,9-HxCDF	ND	0.468					
1,2,3,4,6,7,8-HpCDF	1.02			38:52	0.96		A
1,2,3,4,7,8,9-HpCDF	ND	0.468					
OCDF	1.36			44:40	0.95		A
Total TCDDs	2.34		3.00				
Total PeCDDs	0.804		1.22				Q
Total HxCDDs	3.69		4.19				
Total HpCDDs	16.8						
Total TCDFs	4.07		4.91				
Total PeCDFs	2.21						Q
Total HxCDFs	1.25		1.66				
Total HpCDFs	1.82						
WHO-2005 TEQ (ND=0)	2.48		2.71				
WHO-2005 TEQ (ND=½)	2.79		2.74				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B58A		Weight / Volume:	12.66	g
			Solids / Lipids:	84.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-348		Instrument:	HRMS1	
Sample ID:	G296-348-7B		Filename:	a31jan07a_2-6	
Collection Date/Time:	01/10/07	11:17	Retchk:	a31jan07a-6	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a-6	
Extraction Date:	01/26/07		End ConCal:	a31jan07a_2-14	
Analysis Date/Time:	01/31/07	17:35	Initial Cal:	m8290-071006e	

VALUE CHANGE

S R.A

Method 8290
545B58A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.61	80.7	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.72	86.2	34:09	1.57	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.75	87.7	36:49	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.49	74.6	40:07	1.05	
13C12-OCDD	4.0	2.44	60.9	44:22	0.89	
13C12-2,3,7,8-TCDF	2.0	1.98	98.8	30:39	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.65	82.5	33:21	1.55	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.84	91.9	36:07	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.65	82.3	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.382	95.6	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.389	97.3	33:58	1.57	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.385	96.4	36:45	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.429	107	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.333	83.2	40:49	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B58A		Weight / Volume:	12.66 g
			Solids / Lipids:	84.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-348		Instrument:	HRMS1
Sample ID:	G296-348-7B		Filename:	a31jan07a_2-6
Collection Date/Time:	01/10/07	11:17	Retchk:	a31jan07a-6
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a-6
Extraction Date:	01/26/07		End ConCal:	a31jan07a_2-14
Analysis Date/Time:	01/31/07	17:35	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JWB
Date: 02-07-07

Reviewed by: CW
Date: 2/7/07

Method 8290
545B58B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.125					
1,2,3,7,8-PeCDD	ND	0.481					
1,2,3,4,7,8-HxCDD	ND	0.481					
1,2,3,6,7,8-HxCDD	ND	0.481					
1,2,3,7,8,9-HxCDD	ND	0.481					
1,2,3,4,6,7,8-HpCDD	2.77			40:09	1.05		A
OCDD	142			44:22	0.89		
2,3,7,8-TCDF	0.481 B Z			30:40	0.76		A
1,2,3,7,8-PeCDF	EMPC N	0.481	0.0655 J, W	33:21	1.30	*	A
2,3,4,7,8-PeCDF	0.0693 B, N			33:58	1.63		A
1,2,3,4,7,8-HxCDF	ND	0.481					
1,2,3,6,7,8-HxCDF	ND	0.481					
2,3,4,6,7,8-HxCDF	ND	0.481					
1,2,3,7,8,9-HxCDF	ND	0.481					
1,2,3,4,6,7,8-HpCDF	EMPC	0.481	0.143 J, W	38:54	1.23	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.481					
OCDF	ND	0.963					
Total TCDDs	ND	0.125					
Total PeCDDs	ND	0.481					
Total HxCDDs	0.532		0.716				
Total HpCDDs	7.15						
Total TCDFs	0.481 B, N		0.948				
Total PeCDFs	0.135 B, N						
Total HxCDFs	0.0790 B, N						
Total HpCDFs	ND	0.481	0.143				
WHO-2005 TEQ (ND=0)	0.139		0.143				
WHO-2005 TEQ (ND=½)	0.623		0.617				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B58B		Weight / Volume:	12.04	g
			Solids / Lipids:	86.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-348		Instrument:	HRMS1	
Sample ID:	G296-348-8B		Filename:	a31jan07a_3-2	
Collection Date/Time:	01/10/07	11:23	Retchk:	a31jan07a_2-14	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a_2-14	
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14	
Analysis Date/Time:	02/01/07	1:38	Initial Cal:	m8290-071006e	

Method 8290
545B58B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.56	78.0	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.55	77.4	34:09	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.59	79.4	36:49	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.36	68.1	40:07	1.04	
13C12-OCDD	4.0	2.23	55.7	44:22	0.89	
13C12-2,3,7,8-TCDF	2.0	1.93	96.7	30:39	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.69	84.6	33:21	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.68	83.9	36:07	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.49	74.4	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.378	94.6	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.380	94.9	33:58	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.371	92.9	36:45	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.395	98.7	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.314	78.5	40:48	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B58B		Weight / Volume:	12.04 g
			Solids / Lipids:	86.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-348		Instrument:	HRMS1
Sample ID:	G296-348-8B		Filename:	a31jan07a_3-2
Collection Date/Time:	01/10/07	11:23	Retchk:	a31jan07a_2-14
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a_2-14
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14
Analysis Date/Time:	02/01/07	1:38	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 02.07.07

Reviewed by: _____
Date: 2/7/07

Method 8290 R.A.
545B58C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.121				
1,2,3,7,8-PeCDD	ND	0.486				
1,2,3,4,7,8-HxCDD	ND	0.486				
1,2,3,6,7,8-HxCDD	0.150			36:51	1.38	A
1,2,3,7,8,9-HxCDD	0.282			37:04	1.19	A
1,2,3,4,6,7,8-HpCDD	4.89			40:09	1.01	
OCDD	279			44:22	0.89	
2,3,7,8-TCDF	0.424 B,Z			30:40	0.76	A
1,2,3,7,8-PeCDF	ND	0.486				
2,3,4,7,8-PeCDF	ND	0.486				
1,2,3,4,7,8-HxCDF	ND	0.486				
1,2,3,6,7,8-HxCDF	ND	0.486				
2,3,4,6,7,8-HxCDF	ND	0.486				
1,2,3,7,8,9-HxCDF	ND	0.486				
1,2,3,4,6,7,8-HpCDF	0.167 B,Z			38:52	1.17	A
1,2,3,4,7,8,9-HpCDF	ND	0.486				
OCDF	ND	1.03				
Total TCDDs	ND	0.121				
Total PeCDDs	0.165		0.482			
Total HxCDDs	3.00					
Total HpCDDs	14.1					
Total TCDFs	0.871 B,Z		0.971			
Total PeCDFs	ND	0.486	0.0953			
Total HxCDFs	0.0759 B,Z		0.259			
Total HpCDFs	0.167 B,Z					
WHO-2005 TEQ (ND=0)	0.220		0.220			
WHO-2005 TEQ (ND=½)	0.728		0.728			

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	545B58C		Weight / Volume:	12.58	g
			Solids / Lipids:	81.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-348		Instrument:	HRMS1	
Sample ID:	G296-348-9B		Filename:	a31jan07a_3-3	
Collection Date/Time:	01/10/07	11:29	Retchk:	a31jan07a_2-14	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a_2-14	
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14	
Analysis Date/Time:	02/01/07	2:26	Initial Cal:	m8290-071006e	

Method 8290
545B58C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.54	76.9	31:19	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.50	75.1	34:09	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.66	82.8	36:49	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.46	73.2	40:07	1.05	
13C12-OCDD	4.0	2.43	60.8	44:22	0.89	
13C12-2,3,7,8-TCDF	2.0	1.91	95.7	30:39	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.62	80.8	33:21	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.77	88.4	36:07	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.58	79.2	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.372	92.9	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.366	91.6	33:58	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.376	93.9	36:45	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.424	106	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.337	84.2	40:48	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.26	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	545B58C		Weight / Volume:	12.58 g
			Solids / Lipids:	81.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-348		Instrument:	HRMS1
Sample ID:	G296-348-9B		Filename:	a31jan07a_3-3
Collection Date/Time:	01/10/07	11:29	Retchk:	a31jan07a_2-14
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a_2-14
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14
Analysis Date/Time:	02/01/07	2:26	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JMP
Date: 02.02.07

Reviewed by: CRL
Date: 2/7/07

Method 8290
Dup-5
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.112				
1,2,3,7,8-PeCDD	ND	0.502				Q
1,2,3,4,7,8-HxCDD	ND	0.502				
1,2,3,6,7,8-HxCDD	ND	0.502				
1,2,3,7,8,9-HxCDD	0.255			37:04	1.25	A
1,2,3,4,6,7,8-HpCDD	4.09			40:09	1.07	A
OCDD	246			44:22	0.89	
2,3,7,8-TCDF	0.412 B1Z			30:40	0.81	A
1,2,3,7,8-PeCDF	ND	0.502				
2,3,4,7,8-PeCDF	0.0703 B1Z			33:58	1.59	Q A
1,2,3,4,7,8-HxCDF	ND	0.502				
1,2,3,6,7,8-HxCDF	ND	0.502				
2,3,4,6,7,8-HxCDF	ND	0.502				
1,2,3,7,8,9-HxCDF	ND	0.502				
1,2,3,4,6,7,8-HpCDF	0.137 B1Z			38:54	1.13	A
1,2,3,4,7,8,9-HpCDF	ND	0.502				
OCDF	ND	1.00				
Total TCDDs	ND	0.112				
Total PeCDDs	ND	0.502	0.110			Q
Total HxCDDs	2.15		2.29			
Total HpCDDs	11.9					
Total TCDFs	0.827 B1Z		0.930			
Total PeCDFs	0.161 B1Z					Q
Total HxCDFs	0.112 B1Z					
Total HpCDFs	0.137 B1Z					
WHO-2005 TEQ (ND=0)	0.204		0.204			
WHO-2005 TEQ (ND=½)	0.672		0.672			

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	Dup-5		Weight / Volume:	12.13	g
			Solids / Lipids:	82.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-348		Instrument:	HRMS1	
Sample ID:	G296-348-10B		Filename:	a31jan07a_3-4	
Collection Date/Time:	01/10/07		Retchk:	a31jan07a_2-14	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a_2-14	
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14	
Analysis Date/Time:	02/01/07	3:14	Initial Cal:	m8290-071006e	

Method 8290
Dup-5
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.77	88.7	31:19	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	2.09	104	34:09	1.57	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.94	97.1	36:49	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.64	82.2	40:07	1.05	
13C12-OCDD	4.0	2.65	66.2	44:22	0.89	
13C12-2,3,7,8-TCDF	2.0	2.26	113	30:39	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.87	93.4	33:21	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	2.03	101	36:07	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.77	88.7	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.442	111	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.475	119	33:58	1.58	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.438	110	36:45	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.482	120	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.377	94.2	40:49	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.26	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	Dup-5		Weight / Volume:	12.13 g
			Solids / Lipids:	82.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-348		Instrument:	HRMS1
Sample ID:	G296-348-10B		Filename:	a31jan07a_3-4
Collection Date/Time:	01/10/07		Retchk:	a31jan07a_2-14
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	a31jan07a_2-14
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14
Analysis Date/Time:	02/01/07	3:14	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 2.7.07

Reviewed by: _____
Date: 2/7/07

Method 8290
EQBK-1
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.000939					
1,2,3,7,8-PeCDD	ND	0.00276					
1,2,3,4,7,8-HxCDD	ND	0.00276					
1,2,3,6,7,8-HxCDD	ND	0.00276					
1,2,3,7,8,9-HxCDD	ND	0.00276					
1,2,3,4,6,7,8-HpCDD	0.00303 B Z			39.94	1.00		A
OCDD	0.0230 B Z			44.09	0.87		A
2,3,7,8-TCDF	ND	0.00132					
1,2,3,7,8-PeCDF	ND	0.00276					
2,3,4,7,8-PeCDF	ND	0.00276					
1,2,3,4,7,8-HxCDF	ND	0.00276					
1,2,3,6,7,8-HxCDF	0.00296 B Z			35.99	1.34		A
2,3,4,6,7,8-HxCDF	ND ~~EMPC~~	0.00276	~~0.000663~~ Z	36.47	0.71	*	A
1,2,3,7,8,9-HxCDF	ND	0.00276					
1,2,3,4,6,7,8-HpCDF	0.00488			38.70	1.03		A
1,2,3,4,7,8,9-HpCDF	ND	0.00276					
OCDF	ND	0.00552					
Total TCDDs	ND	0.000939					
Total PeCDDs	ND	0.00276	0.00676				
Total HxCDDs	ND	0.00276					
Total HpCDDs	0.00303 B Z		0.00665				
Total TCDFs	0.00636		0.00747				
Total PeCDFs	0.0151		0.0168				
Total HxCDFs	0.0186		0.0215				
Total HpCDFs	0.00488						
WHO-2005 TEQ (ND=0)	0.000382		0.000448				
WHO-2005 TEQ (ND=½)	0.00360		0.00353				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Water	
Sample ID:	EQBK-1		Weight / Volume:	905	mL
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14080	
Project ID:	G296-348		Instrument:	HRMS3	
Sample ID:	G296-348-11B		Filename:	c26jan07d_4-4	
Collection Date/Time:	01/10/07	12:15	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/22/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	3:56	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
EQBK-1
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.43	71.3	31.03	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.45	72.4	34.00	1.62	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.58	78.8	36.67	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.60	80.1	39.91	1.05	
13C12-OCDD	4.0	2.00	50.1	44.07	0.91	
13C12-2,3,7,8-TCDF	2.0	1.86	93.1	30.21	0.82	
13C12-1,2,3,7,8-PeCDF	2.0	1.52	76.2	33.20	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.67	83.6	35.97	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.63	81.7	38.69	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.337	84.2	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.333	83.1	33.81	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.294	73.6	36.58	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.349	87.3	35.87	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.332	83.0	40.57	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.28	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Water
Sample ID:	EQBK-1		Weight / Volume:	905 mL
			Solids / Lipids:	NA %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14080
Project ID:	G296-348		Instrument:	HRMS3
Sample ID:	G296-348-11B		Filename:	c26jan07d_4-4
Collection Date/Time:	01/10/07	12:15	Retchk:	c26jan07d_3-14
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	c26jan07d_3-14
Extraction Date:	01/22/07		End ConCal:	c26jan07d_4-14
Analysis Date/Time:	01/28/07	3:56	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02-06-07

Reviewed by: MD
Date: 2/16/07

Method 8290
EQBK-2
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.00125					
1,2,3,7,8-PeCDD	0.00510 B1 Z			34.01	1.46		A
1,2,3,4,7,8-HxCDD	0.00383			36.60	1.35		A
1,2,3,6,7,8-HxCDD	0.00381			36.69	1.12		A
1,2,3,7,8,9-HxCDD	ND	0.00324					
1,2,3,4,6,7,8-HpCDD	ND	0.00324					
OCDD	0.0288 B1 Z			44.09	0.89		A
2,3,7,8-TCDF	ND	0.00121					
1,2,3,7,8-PeCDF	0.00464 B1 Z			33.20	1.48		A
2,3,4,7,8-PeCDF	0.00433			33.83	1.64		A
1,2,3,4,7,8-HxCDF	0.00404			35.90	1.14		A
1,2,3,6,7,8-HxCDF	0.00383 B1 Z			35.97	1.12		A
2,3,4,6,7,8-HxCDF	0.00329			36.46	1.28		A
1,2,3,7,8,9-HxCDF	0.00355			37.22	1.13		A
1,2,3,4,6,7,8-HpCDF	0.00368			38.70	1.08		A
1,2,3,4,7,8,9-HpCDF	EMPC	0.00324	0.00244 J,U	40.56	0.81	*	A
OCDF	ND	0.00648					
Total TCDDs	ND	0.00125					
Total PeCDDs	0.00510 B1 Z						
Total HxCDDs	0.00764						
Total HpCDDs	ND	0.00359	0.00513				
Total TCDFs	ND	0.00121					
Total PeCDFs	0.00896						
Total HxCDFs	0.0147						
Total HpCDFs	0.00368		0.00611				
WHO-2005 TEQ (ND=0)	0.00882		0.00884				
WHO-2005 TEQ (ND=½)	0.00970		0.00971				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Water	
Sample ID:	EQBK-2		Weight / Volume:	772	mL
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14080	
Project ID:	G296-348		Instrument:	HRMS3	
Sample ID:	G296-348-12C		Filename:	c26jan07d_4-5	
Collection Date/Time:	01/10/07	12:20	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/22/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	4:44	Initial Cal:	m8290-c110206a	

Method 8290
EQBK-2
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.36	68.2	31.03	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.36	68.1	34.00	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.61	80.3	36.67	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.63	81.7	39.91	1.07	
13C12-OCDD	4.0	2.32	58.0	44.07	0.87	
13C12-2,3,7,8-TCDF	2.0	1.79	89.5	30.21	0.80	
13C12-1,2,3,7,8-PeCDF	2.0	1.48	74.1	33.20	1.61	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.63	81.3	35.97	0.55	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.70	84.8	38.69	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.337	84.1	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.347	86.7	33.81	1.71	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.294	73.5	36.58	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.351	87.7	35.87	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.358	89.4	40.58	0.46	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.42	0.80	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.31	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Water
Sample ID:	EQBK-2		Weight / Volume:	772 mL
			Solids / Lipids:	NA %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14080
Project ID:	G296-348		Instrument:	HRMS3
Sample ID:	G296-348-12C		Filename:	c26jan07d_4-5
Collection Date/Time:	01/10/07	12:20	Retchk:	c26jan07d_3-14
Receipt Date/Time:	01/11/07	10:20	Begin ConCal:	c26jan07d_3-14
Extraction Date:	01/22/07		End ConCal:	c26jan07d_4-14
Analysis Date/Time:	01/28/07	4:44	Initial Cal:	m8290-c110206a

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02-06-07

Reviewed by: CRE
Date: 2/6/07

DATA VALIDATION WORKSHEET
PCB Congeners

Reviewer: RA
Date: 2/24/07
DV Level: II (III) IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG Region III Draft Guidance (April 2004)

Project Name: SWMU 54
Project Number: 11656351
Laboratory: SGS
SDG No.: 6296-348
Method No.: 1668A

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 2-3 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Recommended holding time in the Method is one year. If yes, J(+)/UJ(-). No holding time or preservation requirements are promulgated by EPA for non-water matrices), use professional judgement.		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B".	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	✓		

Notes: *If there are no field blanks, the narrative should include acaution to the user that field blanks were not available for review and any contamination due to field conditions or cross contamination could not be assessed.*

MB displayed Pos. results, B,Z. Yes < Ex.

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/ ± 20% for analytes analyzed by isotope dilution or +/- 35% for analytes analyzed by internal std method? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
~~7~~	~~M+2/M+4~~	1.05	0.89 1.21
~~8~~	~~M+2/M+4~~	0.89	0.76 1.02
~~9~~	~~M+2/M+4~~	~~0.77~~	~~0.65~~ ~~0.89~~
~~10~~	~~M+2/M+4~~	~~0.69~~	~~0.59~~ ~~0.79~~

Notes:

5.0 GC/MS Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start ~~of a 12 hour~~ and end of each analytical sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 330.9792? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Are all IPR, OPR and VER standards within the method QC limits? Results for analytes that do not meet either IPR or OPR requirements should be flagged "J"/"UJ". If analyte is not recovered for an OPR sample, results must be flagged "R" for that analyte.	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?			
7.2	Was an LCS analyzed for each batch?			
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?			
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within the method QC limits?If no, apply J/UJ to associated targets.			
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓		
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.	✓		
10.4	Is the signal to noise ≥ 3 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥3 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.7	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes:

11.0 Ion abundance criteria and EMPC		Yes	No	NA
	For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.			
	For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).			

Notes: Several EMPCs were reported. These were changed to NDs.

12.0 Data Completeness		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported: 0			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Results for Selected PCB Congeners by Method 1668A

Client Sample ID
Lab Method Blank

Laboratory Information			**Sample Information**		
Lab Project ID:			Matrix:	Water	
Lab Sample ID:	LMB14088		Amount:	1000	mL
Dilution factor:	1		pH:	5	
Collection Date/Time:			Solids/Basis:	NA	/ NA
Receipt Date/Time:			QC Batch ID:	WG14088/14088	
Extraction Date:	25-Jan-07		Filename:	b26jan07a-5	
Analysis Date/Time:	26-Jan-07	16:33	ConCal:	b26jan07a-1	
			RRT Std:	b26jan07a-2	
			Initial Cal:	m1668a-b010906d	

Analyte (Congener#)	Amount (pg/L)	EDL (pg/L)	RL (pg/L)	RT	#	Ratio	#	Qualifier
8-DiCB	13.6	4.54	10.0	10:27		1.39		
18,30-TrCB	8.26	4.61	20.0	12:09		0.99		J
31-TrCB	11.3	3.80	10.0	15:25		1.17		
20,28-TrCB	10.0	3.48	20.0	15:43		1.22	#	J K
37-TrCB	ND	2.85	10.0					U
52-TeCB	25.5	3.98	10.0	17:33		0.80		
49,69-TeCB	8.80	3.36	20.0	18:03		0.95	#	J K
44,47,65-TeCB	15.1	3.64	30.0	18:37		1.02	#	J K
61,70,74,76-TeCB	17.4	4.07	40.0	22:57		0.79		J
66-TeCB	ND	3.91	10.0					U
56-TeCB	ND	4.11	10.0					U
60-TeCB	ND	3.91	10.0					U
81-TeCB	ND	5.03	10.0					U
77-TeCB	ND	4.82	10.0					U
95-PeCB	23.6	8.01	10.0	21:53		1.75		
90,101,113-PeCB	23.3	7.07	30.0	25:29		1.55		J
99-PeCB	12.3	6.76	10.0	26:13		1.87	#	K
86,87,97,108,119,125-PeCB	16.8	6.96	60.0	26:58		1.52		J
123-PeCB	ND	5.27	10.0					U
118-PeCB	12.4	5.59	10.0	32:12		1.02	#	K
114-PeCB	ND	5.88	10.0					U
105-PeCB	ND	6.11	10.0					U
126-PeCB	ND	6.54	10.0					U
135,151-HxCB	ND	7.47	20.0					U
132-HxCB	ND	9.88	10.0					U
146-HxCB	ND	8.43	10.0					U
153,168-HxCB	11.9	7.86	20.0	34:49		1.35		J
129,138,163-HxCB	13.9	8.98	30.0	36:41		1.38		J
158-HxCB	ND	6.50	10.0					U
128,166-HxCB	ND	8.34	20.0					U
167-HxCB	ND	4.92	10.0					U
156,157-HxCB	ND	5.96	20.0					U
169-HxCB	ND	5.87	10.0					U
187-HpCB	ND	7.74	10.0					U
183,185-HpCB	ND	9.15	20.0					U
177-HpCB	ND	10.3	10.0					U
180,193-HpCB	ND	8.14	20.0					U
170-HpCB	ND	10.7	10.0					U
189-HpCB	ND	7.23	10.0					U

Results for Selected PCB Congeners by Method 1668A

Client Sample ID
Lab Method Blank

Analyte (Congener#)	Amount (pg/L)	EDL (pg/L)	RL (pg/L)	RT #	Ratio #	Qualifier
201-OcCB	ND	5.86	10.0			U
196-OcCB	ND	8.54	10.0			U
203-OcCB	ND	7.69	10.0			U
195-OcCB	ND	11.7	10.0			U
194-OcCB	ND	10.7	10.0			U
206-NoCB	ND	7.50	10.0			U
209-DeCB	ND	7.98	10.0			U

Recovery Information

Labeled Standard	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards			(25-150%)			
13C-4-DiCB	2.00	1.15	57.3	8:25	1.67	
13C-15-DiCB	2.00	1.21	60.6	12:59	1.62	
13C-19-TrCB	2.00	1.31	65.6	10:41	1.05	
13C-37-TrCB	2.00	1.09	54.5	19:56	1.02	
13C-54-TeCB	2.00	1.12	55.8	13:14	0.84	
13C-81-TeCB	2.00	0.777	38.9	28:16	0.78	
13C-77-TeCB	2.00	0.808	40.4	29:02	0.77	
13C-104-PeCB	2.00	1.33	66.7	18:31	1.61	
13C-123-PeCB	2.00	0.944	47.2	31:43	1.65	
13C-118-PeCB	2.00	0.867	43.4	32:10	1.63	
13C-114-PeCB	2.00	0.851	42.5	32:55	1.65	
13C-105-PeCB	2.00	0.893	44.6	33:52	1.59	
13C-126-PeCB	2.00	0.949	47.4	38:25	1.65	
13C-155-HxCB	2.00	1.50	75.2	25:06	1.28	
13C-167-HxCB	2.00	1.19	59.7	41:09	1.31	
13C-156,157-HxCB	4.00	2.19	54.8	42:55	1.32	
13C-169-HxCB	2.00	1.18	59.0	47:59	1.36	
13C-188-HpCB	2.00	1.48	73.8	32:49	1.06	
13C-189-HpCB	2.00	1.45	72.4	51:53	1.12	
13C-202-OcCB	2.00	1.38	69.1	40:42	0.92	
13C-205-OcCB	2.00	1.28	64.2	55:58	0.92	
13C-208-NoCB	2.00	1.48	74.1	51:02	0.78	
13C-206-NoCB	2.00	1.50	74.9	58:43	0.80	
13C-209-DeCB	2.00	1.37	68.4	61:15	1.21	
Cleanup Standards			(30-135%)			
13C-28-TrCB	2.00	1.29	64.4	15:43	1.05	
13C-111-PeCB	2.00	1.26	63.2	28:59	1.59	
13C-178-HpCB	2.00	1.36	68.0	37:16	1.10	
Injection Standards						
13C-9-DiCB	2.00			9:48	1.66	
13C-52-TeCB	2.00			17:31	0.78	
13C-101-PeCB	2.00			25:27	1.57	
13C-138-HxCB	2.00			36:38	1.22	
13C-194-OcCB	2.00			55:12	0.92	

Analyzed By: AF
Date: 02/09/07

Reviewed By:
Date: 2/9/07

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: RA
Date: 8/24/07
DV Level: II III IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002) X NFG Region III Draft Guidance (March 1999)

Project Name: SWMU54
Project Number:
Laboratory: SDS
SDG No.: G2946-348
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B". (use 10X for OCDD/OCDF data) TEQ values should not be calculated for isomers flagged B.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	✓		

Notes: Method and EBs Positive hits.
<5x → B/Z
all 75x EB conc. no more action.

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-"; by greater than 50%, "J+/R-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "N+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits	
4	M/M+2	0.77	0.65- 0.89	
5	M+2/M+4	1.55	1.32- 1.78	
6	M+2/M+2	1.24	1.05- 1.43	
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	
~~7~~	~~M+2/M+4~~	~~1.04~~	~~0.88- 1.20~~	N/A for APPIX
~~8~~	~~M+2~~	~~0.89~~	~~0.76- 1.02~~	N/A for APPIX

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓		

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed at the same frequency as calibrations that defines descriptor switching times of scan ranges? If not, make a note in DV Report.	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≤ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

OPR/OPRD was performed.

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	✓		
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		
8.3	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	✓		

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.	✓		
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

	545B58C	EDL	DUP-5		545B58C	DUP-5	RPD
1,2,3,6,7,8-HxCDD	0.15	0.5	ND OK✓	total HpCDDs	14.1	11.9	17% OK✓
1,2,3,7,8,9-HxCDD	0.282		0.255 OK				
1,2,3,4,6,7,8-HpCDD	4.89		4.09 RPD=18% OK✓				
OCDD	279		246 RPD=13% OK✓				
total P_2CDDs	0.165	0.5	ND OK✓				
total HxCDDs	3		2.15 RPD=33% OK✓				

10.0 Sample Results/Detection Limit Verification		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓		
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.	✓		
10.4	Is the signal to noise ≥ 2.5 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥ 2.5 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Are the two identification peak apexs within 2 seconds for positive identifications? If not, result is reported as non-detect,	✓		
10.7	Are polychlorinated diphenyl ether (PCDPE) interferences in the PCDPE channel with a S/N ratio > 2.5 and with a RT within ± 2 seconds? If yes, qualify positive furan results I.		✓	
10.8	Was a second column confirmation used for positive 2,3,7,8-TCDF?	✓		
	If no, apply "R" to the positive 2,3,7,8-TCDF results.			
	If yes, calculate the %D between the two column results, report the lower of the two values if the %D is > 25% and qualify J.			
10.9	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.10	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes:

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
11.1	Are Isotopic ratios for a detected analyte within the following established control limits...?	✓		

# Cl ion atoms	Ion Type	Theoretical	Control Limits	RIII Expanded Limits
4	M/M+2	0.77	0.65- 0.89	0.58- 0.96
5	M+2/M+4	1.55	1.32- 1.78	1.16- 1.94
6	M+2/M+2	1.24	1.05- 1.43	0.93- 1.55
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	0.38- 0.64
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	0.33- 0.55
7	M+2/M+4	1.04	0.88- 1.2	0.78- 1.30
8	M+2	0.89	0.76- 1.02	0.67- 1.11

	For positive field sample results with ion abundance ratios outside the method control limits but within the expanded RIII limits, The laboratory should report the concentration as an estimated maximum possible concentration (EMPC). Region III requires this type of result to be reported as true PCDD/PCDF isomer. The validator shall also qualify J.			
	For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.			
	For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).			
11.2	RIII separates 2,3,7,8-chlorinated isomers from total isomers for each congener group and reports results as 2,3,7,8-chlorine substituted and 'Other Total' PCDD/PCDF isomers. If laboratory did not report these separate, make a note in the DV report.	✓		

Notes: for EMPC if ratio outside 15%. but within Region III 25% J JIW
ion abundance ratio >25% J changed to NDs ✓

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported:			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.000920					
1,2,3,7,8-PeCDD	0.00102			34.05	1.44		A
1,2,3,4,7,8-HxCDD	ND	0.00250					
1,2,3,6,7,8-HxCDD	ND	0.00250					
1,2,3,7,8,9-HxCDD	ND	0.00250					
1,2,3,4,6,7,8-HpCDD	0.00370			39.96	1.11		A
OCDD	0.0480			44.08	0.97		A
2,3,7,8-TCDF	ND	0.000904					
1,2,3,7,8-PeCDF	0.000940			33.22	1.37		A
2,3,4,7,8-PeCDF	EMPC	0.00250	0.000980	33.85	1.31	*	A
1,2,3,4,7,8-HxCDF	EMPC	0.00250	0.000980	35.90	0.89	*	A
1,2,3,6,7,8-HxCDF	0.00120			35.99	1.36		A
2,3,4,6,7,8-HxCDF	EMPC	0.00250	0.000720	36.49	1.04	*	A
1,2,3,7,8,9-HxCDF	ND	0.00250					
1,2,3,4,6,7,8-HpCDF	EMPC	0.00250	0.00178	38.72	1.36	*	A
1,2,3,4,7,8,9-HpCDF	EMPC	0.00250	0.000720	40.61	0.86	*	A
OCDF	EMPC	0.00500	0.00472	44.38	1.08	*	A
Total TCDDs	ND	0.000920					
Total PeCDDs	0.00102						
Total HxCDDs	ND	0.00250					
Total HpCDDs	0.00370						
Total TCDFs	ND	0.000904					
Total PeCDFs	0.000940		0.00192				
Total HxCDFs	0.00120		0.00290				
Total HpCDFs	ND	0.00250	0.00250				
WHO-2005 TEQ (ND=0)	0.00122		0.00171				
WHO-2005 TEQ (ND=½)	0.00288		0.00272				

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Water	
Sample ID:	Lab Method Blank		Weight / Volume:	1000	mL
			Solids / Lipids:	NA	%
			Original pH :	5	
Laboratory Information			Batch ID:	WG14080	
Project ID:			Instrument:	HRMS3	
Sample ID:			Filename:	c26jan07d_4-3	
Collection Date/Time:			Retchk:	c26jan07d_3-14	
Receipt Date/Time:			Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/22/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	3:07	Initial Cal:	m8290-c110206a	

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.341				
1,2,3,7,8-PeCDD	ND	0.500				
1,2,3,4,7,8-HxCDD	ND	0.878				
1,2,3,6,7,8-HxCDD	ND	0.910				
1,2,3,7,8,9-HxCDD	ND	0.887				
1,2,3,4,6,7,8-HpCDD	ND	2.25				
OCDD	3.24			42:42	0.93	A
2,3,7,8-TCDF	0.430			28:51	0.72	A
1,2,3,7,8-PeCDF	ND	0.500				
2,3,4,7,8-PeCDF	ND	0.500				
1,2,3,4,7,8-HxCDF	ND	0.555				
1,2,3,6,7,8-HxCDF	ND	0.531				
2,3,4,6,7,8-HxCDF	ND	0.550				
1,2,3,7,8,9-HxCDF	ND	0.625				
1,2,3,4,6,7,8-HpCDF	ND	0.847				
1,2,3,4,7,8,9-HpCDF	ND	1.05				
OCDF	ND	1.00				
Total TCDDs	ND	0.341				
Total PeCDDs	ND	0.500				
Total HxCDDs	ND	0.910				
Total HpCDDs	ND	2.25				
Total TCDFs	0.704					
Total PeCDFs	ND	0.500				
Total HxCDFs	ND	0.625				
Total HpCDFs	ND	1.05				
WHO-2005 TEQ (ND=0)	0.0440		0.0440			
WHO-2005 TEQ (ND=½)	0.815		0.815			

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10.0	g
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14084	
Project ID:			Instrument:	HRMS1	
Sample ID:			Filename:	a24jan07b_4-3	
Collection Date/Time:			Retchk:	a24jan07b_3-14	
Receipt Date/Time:			Begin ConCal:	a24jan07b_3-14	
Extraction Date:	01/24/07		End ConCal:	a24jan07b_4-14	
Analysis Date/Time:	01/25/07	22:22	Initial Cal:	m8290-071006e	

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.253					
1,2,3,7,8-PeCDD	EMPC	0.500	0.0960	34:10	1.12	*	Q A
1,2,3,4,7,8-HxCDD	ND	0.500					
1,2,3,6,7,8-HxCDD	ND	0.500					
1,2,3,7,8,9-HxCDD	ND	0.500					
1,2,3,4,6,7,8-HpCDD	0.358			40:09	1.02		A
OCDD	2.46			44:22	0.87		A
2,3,7,8-TCDF	0.460			30:40	0.86		A
1,2,3,7,8-PeCDF	0.112			33:21	1.63		A
2,3,4,7,8-PeCDF	0.124			33:58	1.51		Q A
1,2,3,4,7,8-HxCDF	ND	0.500					
1,2,3,6,7,8-HxCDF	EMPC	0.500	0.0960	36:09	1.52	*	A
2,3,4,6,7,8-HxCDF	ND	0.500					
1,2,3,7,8,9-HxCDF	ND	0.500					
1,2,3,4,6,7,8-HpCDF	0.132			38:52	1.19		A
1,2,3,4,7,8,9-HpCDF	ND	0.500					
OCDF	ND	1.00					
Total TCDDs	ND	0.253					
Total PeCDDs	ND	0.500	0.0960				Q
Total HxCDDs	ND	0.500					
Total HpCDDs	0.664						
Total TCDFs	0.460		0.818				
Total PeCDFs	0.236						Q
Total HxCDFs	0.0960						
Total HpCDFs	0.132						
WHO-2005 TEQ (ND=0)	0.0922		0.198				
WHO-2005 TEQ (ND=½)	0.647		0.477				

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10.0	g
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:			Instrument:	HRMS1	
Sample ID:			Filename:	a31jan07a_2-3	
Collection Date/Time:			Retchk:	a31jan07a-6	
Receipt Date/Time:			Begin ConCal:	a31jan07a-6	
Extraction Date:	01/26/07		End ConCal:	a31jan07a_2-14	
Analysis Date/Time:	01/31/07	15:12	Initial Cal:	m8290-071006e	

SGS

Case Narrative
SGS Project: **G296-348**
Project Name: **SWMU 54 RFI**

For Methods: 8290 & 1668A

- The submitted samples were accepted into the lab on January 11th, 2007 and extracted between January 22nd and January 26th, 2007 by methods 3540C and 3520C. The sample extracts and associated QC extracts were then processed through clean-up by method 3630/3620 and analyzed by HRGC/HRMS for methods 8290 and 1668A..

Craig R. Tronzo 2/8/07

Craig R. Tronzo Date
Data Validation/QA Officer

Secondary Review

W. Mike Larkins Date
Technical Director

Or Heather Patterson 08Feb07

Heather Patterson Date
Director

SGS

List of Qualifiers

B	Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.
EDL	"Estimated Detection Limit"
EMPC	"Estimated Maximum Possible Concentration"
ppt	Parts-per-trillion (pg/g; ng/L)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.
#	Outside quality control limits
*	See case narrative

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A	Amount detected is less than the Lower Calibration Limit.
J	Amount detected is between the Method Detection Limit and the Lower Calibration Limit.
E	Amount detected is greater than the Upper Calibration Limit.
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).
Q	Indicates the presence of a quantitative interference. This situation generally results in an underestimation of the affected analyte(s).
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).
DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

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Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP[+]
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
[+] Massachusetts Department of Environmental Protection

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~~066961~~ 1/10/07-2

(1)

CLIENT: URS

CONTACT: Roshanak Aryan PHONE NO: (804) 474-5431

PROJECT: SWMU 54 RFI SITE/PWSID#:

REPORTS TO: E-MAIL: Roshanak_Aryan@URSCorp.com

Roshanak Aryan FAX NO.: (804) 965-9764

INVOICE TO: URS QUOTE #

P.O. NUMBER

SGS Reference: G296-348

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(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP G=GRAB)	Preservatives Used	Analysis Required (3)	REMARKS
	545B27A	1/10/07	9:36	Soil	1	G	ice	Diox in Liquid	
	545B27B		9:41		1				
	545B27C		9:48		1				
	34A		1340		1				
	34B		1345		1				
	34C		1350		1				
	58A		1117		1				
	58B		1123		1				
	58C		1129		1				
	DUP-5		—		1				

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
John Spengler	1/10/07	1700	
Relinquished By: (2)	Date	Time	Received By:
	1/11/07	1020	Amy Dickaney
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier: FedEx

Shipping Ticket No: 8600 1563 5220

Samples Received Cold? (Circle) YES NO

Temperature °C: 1-9 T

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

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(1)

CLIENT: URS

CONTACT: Roshanak Aryan PHONE NO:(804) 474-5431

PROJECT: SWMU 54 SITE/PWSID#:

REPORTS TO: Roshanak Aryan E-MAIL: Roshanak_Aryan@urscorp.com

FAX NO.:(804 965-9764

INVOICE TO: URS QUOTE #

P.O. NUMBER

SGS Reference: G296-348

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(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE C=COMP G=GRAB	Preservatives Used	Analysis Required (3) Dioxin/Furan	PCB Congeners	REMARKS
	EQBK-1 ✓	1/10/07	1215	water	1	G	✓			
	EQBK-2 ✓	✓	1220		2	G	✓	✓		
	✓									

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
John Spengler	1/10/07	1700	
Relinquished By: (2)	Date 1/11/07	Time 1020	Received By: Amy DiLaney
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier: FedEx
Shipping Ticket No: 8600 1563 5620

Samples Received Cold? (Circle) YES NO
Temperature °C: 1.9

Special Deliverable Requirements:

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

7

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **URS** Lab Proj. ID: **G296-348**

Client Proj. ID: **SWMU 54 RFI**

1. X Shipped — Notes:
   __ Hand Delivered

2. __ Proper, full, and complete documentation — Notes:
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   X Acceptable documentation (but, incomplete)
   __ Unacceptable documentation

3. X Custody Tape on Container — Notes:
   __ No Custody Tape

4. X Samples Intact* — Notes:
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles

5. X Chilled on Receipt* Actual Temp.(s) in °C: 1.9 — Notes:
   __ Ambient on Receipt
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol

6. X Sufficient Sample Submitted — Notes:
   __ Insufficient Sample Submitted

7. X Samples Preserved Correctly* — Notes:
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)

8. X Received Within Holding Time — Notes:
   __ Not Received Within Holding Time
   __ N/A

9. X No Discrepancies Noted — Notes:
   __ Discrepancies Noted

Comments:

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

Inspected and Logged in by:

DC27.091503.3 Date / Time: Thu-1/11/07 16:10

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-349 **Fraction:** PCB Congeners & Dioxin/Furans

Lab: Paradigm Analytical **Project Name** Radford SWMU 54

Reviewer: RA **Date:** March 1, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: For the PCB-Congeners analyses, the method blank displayed positive detections for several congeners. Positive associated field sample results less than five times the method blank concentrations were flagged "B,z".

Sample 54SB57A displayed ion ratios for 13C-19-TrCB, 13C-208-NoCB, and 13C-209-DeCB that were outside the method control limits but within the Region III expanded control limits of +/- 25%. No data qualifying action was taken.

Sample 54SB57A displayed detections for several congeners that were flagged "K" by the laboratory. It was confirmed by the laboratory that these were estimated maximum possible concentrations (EMPCs). In cases where the ion abundance ratio was outside the EPA Region III criterion of +/- 25%, the results were changed to a non-detect, except where previously flagged for method blank contamination.

For the dioxin-furans analyses, the aqueous and soil method blanks displayed positive detections for several compounds. Positive associated field sample results less than ten times the method blank concentration for OCDD and less than five times the method blank concentrations for the other compounds were flagged "B,z". The equipment blank, EQBK-4 also displayed positive detections for several compounds. The associated field sample results were greater than five times the equipment blank concentrations, and no data qualifying action was necessary.

Several samples displayed detections reported by the laboratory as EMPCs. In cases where the EMPC displayed an ion abundance ratio outside the method criterion of a theoretical ratio +/- 15% but within the EPA Region III criterion of +/- 25%, the EMPC was qualified as "J,w". In cases where the EMPC displayed an ion abundance ratio

greater than the EPA Region III criterion of +/- 25%, the EMPC was changed to a non-detect.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed. It should be noted that detection limits were raised for the PCB-Congeners analyses of sample 54SB57A due to dilutions.

Signed: Ranjan

Paradigm Analytical Laboratories

Cust Proj ID: SWMU 54 RFI
Client Name: URS

G296-349

Due Date: 2007-02-02 17:00:00
Login Date: 2007-01-12 11:03:29

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G296-349-1	A	EQBK-4	STD	2007-01-11 14:30:00	2007-01-12	2007-02-02	Water	W2	Full	8290	LG::REVW
	B					2007-02-02	Water	W2	Full	8290	LG::REVW
G296-349-2	A	54SB83A	STD	2007-01-11 10:12:00	2007-01-12	2007-02-02	Soil	W2	Full	8290	LG::REVW
G296-349-3	A	54SB83B	STD	2007-01-11 10:17:00	2007-01-12	2007-02-02	Soil	W2	Full	8290	LG::REVW
G296-349-4	A	54SB83C	STD	2007-01-11 10:24:00	2007-01-12	2007-02-02	Soil	W2	Full	8290	LG::REVW
G296-349-5	A	54SB38A	STD	2007-01-11 11:35:00	2007-01-12	2007-02-02	Soil	W2	Full	8290	LG::REVW
G296-349-6	A	54SB38B	STD	2007-01-11 11:42:00	2007-01-12	2007-02-02	Soil	W2	Full	8290	LG::REVW
G296-349-7	A	54SB38C	STD	2007-01-11 11:50:00	2007-01-12	2007-02-02	Soil	W2	Full	8290	LG::REVW
G296-349-8	A	54SB57A	STD	2007-01-11 12:10:00	2007-01-12	2007-02-02	Soil	W2	Full	1668A	LG::REVW
G296-349-9	A	Dup 6	STD	2007-01-11 00:00:00	2007-01-12	2007-02-02	Soil	W2	Full	8290	LG::REVW

Dups

01/12/2007

Results for Selected PCB Congeners by Method 1668A

Client Project ID:
SWMU 54 RFI

Client Sample ID
54SB57A

Laboratory Information			**Sample Information**		
Lab Project ID:	G296-349		Matrix:	Soil	
Lab Sample ID:	G296-349-8C		Amount:	15.7	g
Dilution factor:	5		pH:	NA	
Collection Date/Time:	11-Jan-07	12:10	Solids/Basis:	83.2	/ Dry
Receipt Date/Time:	12-Jan-07	10:15	QC Batch ID:	WG14070/14057	
Extraction Date:	16-Jan-07		Filename:	b20jan07a-6	
Analysis Date/Time:	20-Jan-07	20:03	ConCal:	b20jan07a-1	
			RRT Std:	b20jan07a-2	
			Initial Cal:	m1668a-b010906d	

Analyte (Congener#)	Amount (pg/g)	EDL (pg/g)	RL (pg/g)	RT #	Ratio #	Qualifier
8-DiCB	7.46 B,Z	3.83	3.83	10:31	1.41	
18,30-TrCB	9.96 B,Z	4.89	7.67	12:13	1.33 #	K
31-TrCB	19.5	3.78	3.83	15:28	1.03	
20,28-TrCB	17.9	3.64	7.67	15:46	1.04	
37-TrCB	11.1 B,Z	3.74	3.83	20:01	0.97	
52-TeCB	716	7.59	4.10	17:36	0.77	
49,69-TeCB	123	6.28	7.67	18:07	0.84	
44,47,65-TeCB	247	6.83	11.5	18:39	0.80	
61,70,74,76-TeCB	578	3.87	15.3	23:00	0.76	
66-TeCB	143	3.87	3.83	23:24	0.79	
56-TeCB	54.2	3.93	3.83	24:15	0.76	
60-TeCB	23.1	3.86	3.83	24:30	0.81	
81-TeCB	ND	3.90	3.83			U
77-TeCB	9.25	3.87	3.83	29:07	0.76	
95-PeCB	1320	11.1	3.83	21:57	1.62	
90,101,113-PeCB	1760	10.0	11.5	25:32	1.62	
99-PeCB	685	8.98	3.83	26:16	1.51	
86,87,97,108,119,125-PeCB	1180	9.81	23.0	27:02	1.55	
123-PeCB	ND ~~34.1~~	8.24	3.83	31:48	2.12 #	~~K~~ U
118-PeCB	1640	7.78	3.83	32:15	1.54	
114-PeCB	38.4	9.13	3.83	33:00	1.45	
105-PeCB	745	9.10	3.83	33:57	1.56	
126-PeCB	ND ~~15.5~~	10.1	3.83	38:30	1.07 #	~~K~~ U
135,151-HxCB	795	16.1	7.67	29:22	1.30	
132-HxCB	1020	27.1	3.83	32:24	1.30	
146-HxCB	363	21.8	3.83	34:00	1.26	
153,168-HxCB	2560	21.4	7.67	34:53	1.28	
129,138,163-HxCB	3900	24.3	11.5	36:44	1.30	
158-HxCB	350	16.8	3.83	37:18	1.28	
128,166-HxCB	642	21.3	7.67	38:37	1.25	
167-HxCB	135	7.77	3.83	41:15	1.27	
156,157-HxCB	381	11.5	7.67	42:59	1.25	
169-HxCB	ND	9.27	3.83			U
187-HpCB	640	10.1	3.83	38:42	1.01	
183,185-HpCB	378	20.5	7.67	39:38	1.01	
177-HpCB	374	23.6	3.83	40:39	0.98	
180,193-HpCB	1270	19.1	7.67	45:06	1.07	
170-HpCB	698	24.6	3.83	47:05	1.06	
189-HpCB	21.7	8.93	3.83	52:02	1.04	

VALUE CHANGE 152

Results for Selected PCB Congeners by Method 1668A

Client Project ID:
SWMU 54 RFI

Client Sample ID
54SB57A

Analyte (Congener#)	Amount (pg/g)	EDL (pg/g)	RL (pg/g)	RT #	Ratio #	Qualifier
201-OcCB	31.8	15.9	3.83	42:11	0.93	
196-OcCB	152	22.2	3.83	49:10	0.94	
203-OcCB	155	18.7	3.83	49:29	0.89	
195-OcCB	119	14.4	3.83	51:34	0.99	
194-OcCB	264	13.9	3.83	55:21	0.93	
206-NoCB	57.8	8.67	3.83	58:53	0.67	
209-DeCB	~~ND22.5~~	17.9	3.83	61:22	1.55 #	~~K~~ U

Recovery Information

Labeled Standard	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards			(25-150%)			
13C-4-DiCB	2.00	0.576	28.8	8:28	1.69	
13C-15-DiCB	2.00	0.982	49.1	13:01	1.59	
13C-19-TrCB	2.00	0.758	37.9	10:44	0.86 #	
13C-37-TrCB	2.00	1.19	59.3	19:59	1.04	
13C-54-TeCB	2.00	0.781	39.1	13:16	0.80	
13C-81-TeCB	2.00	0.966	48.3	28:20	0.81	
13C-77-TeCB	2.00	0.918	45.9	29:06	0.73	
13C-104-PeCB	2.00	1.07	53.3	18:34	1.49	
13C-123-PeCB	2.00	0.956	47.8	31:46	1.33	
13C-118-PeCB	2.00	0.908	45.4	32:14	1.56	
13C-114-PeCB	2.00	0.860	43.0	32:58	1.72	
13C-105-PeCB	2.00	0.846	42.3	33:55	1.71	
13C-126-PeCB	2.00	0.935	46.7	38:29	1.55	
13C-155-HxCB	2.00	1.16	58.0	25:09	1.33	
13C-167-HxCB	2.00	1.12	56.0	41:13	1.29	
13C-156,157-HxCB	4.00	2.15	53.8	42:58	1.26	
13C-169-HxCB	2.00	1.04	52.1	48:04	1.33	
13C-188-HpCB	2.00	1.04	52.0	32:52	1.02	
13C-189-HpCB	2.00	1.08	54.2	51:59	1.06	
13C-202-OcCB	2.00	0.984	49.2	40:45	0.80	
13C-205-OcCB	2.00	0.789	39.4	56:05	0.90	
13C-208-NoCB	2.00	0.951	47.6	51:07	0.91 #	
13C-206-NoCB	2.00	0.953	47.6	58:49	0.75	
13C-209-DeCB	2.00	0.748	37.4	61:21	1.37 #	
Cleanup Standards			(30-135%)			
13C-28-TrCB	2.00	1.10	54.8	15:45	1.17	
13C-111-PeCB	2.00	0.907	45.3	29:03	1.78	
13C-178-HpCB	2.00	0.863	43.1	37:20	1.07	
Injection Standards						
13C-9-DiCB	2.00			9:51	1.72	
13C-52-TeCB	2.00			17:34	0.82	
13C-101-PeCB	2.00			25:30	1.48	
13C-138-HxCB	2.00			36:41	1.21	
13C-194-OcCB	2.00			55:18	0.77	

Analyzed By: SF
Date: 02/09/07

Reviewed By:
Date: 2/9/07

VALUE CHANGE

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Method 8290
EQBK-4
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.000894					
1,2,3,7,8-PeCDD	0.000925 B7 Z			33.99	1.44		A
1,2,3,4,7,8-HxCDD	ND	0.00263					
1,2,3,6,7,8-HxCDD	ND	0.00263					
1,2,3,7,8,9-HxCDD	ND	0.00263					
1,2,3,4,6,7,8-HpCDD	ND	0.00263					
OCDD	0.0123 B7 Z			44.08	0.85		A
2,3,7,8-TCDF	ND	0.000871					
1,2,3,7,8-PeCDF	EMPC	0.00263	0.00128 J,W	33.21	1.86	*	A
2,3,4,7,8-PeCDF	ND ~~EMPC~~	0.00263	~~0.000925~~	33.84	2.04	*	A
1,2,3,4,7,8-HxCDF	ND	0.00263					
1,2,3,6,7,8-HxCDF	EMPC	0.00263	0.000484 J,W	35.98	1.51	*	A
2,3,4,6,7,8-HxCDF	ND	0.00263					
1,2,3,7,8,9-HxCDF	ND	0.00263					
1,2,3,4,6,7,8-HpCDF	0.000757			38.73	0.91		A
1,2,3,4,7,8,9-HpCDF	ND	0.00263					
OCDF	ND	0.00526					
Total TCDDs	ND	0.000904					
Total PeCDDs	0.000925 B7 Z						
Total HxCDDs	ND	0.00263					
Total HpCDDs	ND	0.00263	0.000967				
Total TCDFs	ND	0.000871					
Total PeCDFs	ND	0.00263	0.00221				
Total HxCDFs	ND	0.00263	0.000484				
Total HpCDFs	0.000757		0.00109				
WHO-2005 TEQ (ND=0)	0.000936		0.00130				
WHO-2005 TEQ (ND=½)	0.00281		0.00261				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Water	
Sample ID:	EQBK-4		Weight / Volume:	951 mL	
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14080	
Project ID:	G296-349		Instrument:	HRMS3	
Sample ID:	G296-349-1C		Filename:	c26jan07d_4-6	
Collection Date/Time:	01/11/07	14:30	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/22/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	5:32	Initial Cal:	m8290-c110206a	

VALUE CHANGE

Method 8290
EQBK-4
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.46	73.2	31.05	0.84	
13C12-1,2,3,7,8-PeCDD	2.0	1.45	72.4	34.01	1.57	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.60	80.2	36.67	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.59	79.5	39.92	1.06	
13C12-OCDD	4.0	1.87	46.7	44.08	0.89	
13C12-2,3,7,8-TCDF	2.0	1.90	95.2	30.22	0.77	
13C12-1,2,3,7,8-PeCDF	2.0	1.58	78.9	33.20	1.61	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.66	83.1	35.97	0.55	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.59	79.6	38.69	0.47	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.318	79.5	31.06	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.331	82.7	33.81	1.63	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.252	63.0	36.60	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.309	77.2	35.87	0.53	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.332	83.1	40.58	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30.43	0.81	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36.91	1.32	

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Water	
Sample ID:	EQBK-4		Weight / Volume:	951 mL	
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14080	
Project ID:	G296-349		Instrument:	HRMS3	
Sample ID:	G296-349-1C		Filename:	c26jan07d_4-6	
Collection Date/Time:	01/11/07	14:30	Retchk:	c26jan07d_3-14	
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/22/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	5:32	Initial Cal:	m8290-c110206a	

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02-06-07

Reviewed by: MEW
Date: 2/6/07

Method 8290
54SB83A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.108				
1,2,3,7,8-PeCDD	ND	0.461				Q
1,2,3,4,7,8-HxCDD	ND	0.461				
1,2,3,6,7,8-HxCDD	ND	0.461				
1,2,3,7,8,9-HxCDD	ND	0.461				
1,2,3,4,6,7,8-HpCDD	2.33			40:09	1.09	A
OCDD	113			44:22	0.90	
2,3,7,8-TCDF	0.402 B,Z			30:40	0.76	A
1,2,3,7,8-PeCDF	ND	0.461				
2,3,4,7,8-PeCDF	ND	0.461				Q
1,2,3,4,7,8-HxCDF	ND	0.461				
1,2,3,6,7,8-HxCDF	ND	0.461				
2,3,4,6,7,8-HxCDF	ND	0.461				
1,2,3,7,8,9-HxCDF	ND	0.461				
1,2,3,4,6,7,8-HpCDF	0.109 B,Z			38:52	0.98	A
1,2,3,4,7,8,9-HpCDF	ND	0.461				
OCDF	ND	0.923				
Total TCDDs	ND	0.108				
Total PeCDDs	ND	0.461				Q
Total HxCDDs	0.498		0.818			
Total HpCDDs	7.14					
Total TCDFs	0.705 B,Z		0.880			
Total PeCDFs	ND	0.461				Q
Total HxCDFs	0.0941 B,Z					
Total HpCDFs	0.109 B,Z					
WHO-2005 TEQ (ND=0)	0.0985		0.0985			
WHO-2005 TEQ (ND=½)	0.623		0.623			

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB83A		Weight / Volume:	12.54 g	
			Solids / Lipids:	86.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-349		Instrument:	HRMS1	
Sample ID:	G296-349-2B		Filename:	a31jan07a_3-5	
Collection Date/Time:	01/11/07	10:12	Retchk:	a31jan07a_2-14	
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a31jan07a_2-14	
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14	
Analysis Date/Time:	02/01/07	4:01	Initial Cal:	m8290-071006e	

Method 8290
54SB83A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.78	89.1	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	2.07	104	34:09	1.57	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.85	92.5	36:49	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.61	80.6	40:07	1.05	
13C12-OCDD	4.0	2.61	65.1	44:22	0.89	
13C12-2,3,7,8-TCDF	2.0	2.18	109	30:39	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.87	93.3	33:21	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.99	99.6	36:07	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.76	88.2	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.434	109	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.478	119	33:58	1.57	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.393	98.3	36:45	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.458	114	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.366	91.5	40:48	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB83A		Weight / Volume:	12.54 g
			Solids / Lipids:	86.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-349		Instrument:	HRMS1
Sample ID:	G296-349-2B		Filename:	a31jan07a_3-5
Collection Date/Time:	01/11/07	10:12	Retchk:	a31jan07a_2-14
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a31jan07a_2-14
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14
Analysis Date/Time:	02/01/07	4:01	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02-09-07

Reviewed by: KND
Date: 2/7/07

Method 8290
54SB83B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.116				
1,2,3,7,8-PeCDD	ND	0.467				Q
1,2,3,4,7,8-HxCDD	ND	0.467				
1,2,3,6,7,8-HxCDD	ND	0.467				
1,2,3,7,8,9-HxCDD	ND	0.467				
1,2,3,4,6,7,8-HpCDD	2.51			40:09	1.16	A
OCDD	170			44:22	0.89	
2,3,7,8-TCDF	0.498 B,Z			30:40	0.68	A
1,2,3,7,8-PeCDF	ND	0.467				
2,3,4,7,8-PeCDF	0.0579 B,Z			33:58	1.71	Q A
1,2,3,4,7,8-HxCDF	ND	0.467				
1,2,3,6,7,8-HxCDF	ND	0.467				
2,3,4,6,7,8-HxCDF	ND	0.467				
1,2,3,7,8,9-HxCDF	ND	0.467				
1,2,3,4,6,7,8-HpCDF	0.108 B,Z			38:52	1.01	A
1,2,3,4,7,8,9-HpCDF	ND	0.467				
OCDF	ND	0.933				
Total TCDDs	ND	0.116				
Total PeCDDs	ND	0.467				Q
Total HxCDDs	0.870					
Total HpCDDs	7.25					
Total TCDFs	0.933 B,Z		1.07			
Total PeCDFs	0.0579 B,Z					Q
Total HxCDFs	0.0709 B,Z					
Total HpCDFs	0.108 B,Z					
WHO-2005 TEQ (ND=0)	0.144		0.144			
WHO-2005 TEQ (ND=½)	0.608		0.608			

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB83B		Weight / Volume:	12.71 g
			Solids / Lipids:	84.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-349		Instrument:	HRMS1
Sample ID:	G296-349-3B		Filename:	a31jan07a_3-6
Collection Date/Time:	01/11/07	10:17	Retchk:	a31jan07a_2-14
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a31jan07a_2-14
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14
Analysis Date/Time:	02/01/07	4:49	Initial Cal:	m8290-071006e

Method 8290
54SB83B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.65	82.7	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.97	98.7	34:09	1.57	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.78	89.1	36:49	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.66	82.8	40:07	1.05	
13C12-OCDD	4.0	2.43	60.8	44:22	0.90	
13C12-2,3,7,8-TCDF	2.0	2.07	104	30:39	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.75	87.6	33:21	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.88	94.0	36:07	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.68	84.2	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.392	98.1	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.433	108	33:58	1.58	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.404	101	36:45	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.421	105	36:01	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.347	86.9	40:48	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB83B		Weight / Volume:	12.71 g
			Solids / Lipids:	84.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-349		Instrument:	HRMS1
Sample ID:	G296-349-3B		Filename:	a31jan07a_3-6
Collection Date/Time:	01/11/07	10:17	Retchk:	a31jan07a_2-14
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a31jan07a_2-14
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14
Analysis Date/Time:	02/01/07	4:49	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 02-07-07

Reviewed by: _____
Date: 2/7/07

Method 8290
54SB83C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.114					
1,2,3,7,8-PeCDD	ND	0.506					Q
1,2,3,4,7,8-HxCDD	ND	0.506					
1,2,3,6,7,8-HxCDD	ND	0.506					
1,2,3,7,8,9-HxCDD	ND	0.506					
1,2,3,4,6,7,8-HpCDD	2.81			40:09	1.05		A
OCDD	170			44:22	0.88		
2,3,7,8-TCDF	0.425 B1Z			30:40	0.75		A
1,2,3,7,8-PeCDF	ND	0.506					
2,3,4,7,8-PeCDF	EMPC	0.506	0.0809 J,W	33:58	1.20	*	Q A
1,2,3,4,7,8-HxCDF	ND	0.506					
1,2,3,6,7,8-HxCDF	ND	0.506					
2,3,4,6,7,8-HxCDF	ND	0.506					
1,2,3,7,8,9-HxCDF	ND	0.506					
1,2,3,4,6,7,8-HpCDF	ND ~~EMPC~~	0.506	~~0.113~~	38:52	1.51	*	A
1,2,3,4,7,8,9-HpCDF	ND	0.506					
OCDF	ND	1.01					
Total TCDDs	ND	0.114					
Total PeCDDs	ND	0.506					Q
Total HxCDDs	1.01		1.14				
Total HpCDDs	7.96						
Total TCDFs	0.746 B1Z		0.841				
Total PeCDFs	0.0809 B1Z						Q
Total HxCDFs	ND	0.506					
Total HpCDFs	ND	0.506	0.113				
WHO-2005 TEQ (ND=0)	0.122		0.147				
WHO-2005 TEQ (ND=½)	0.697		0.644				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB83C		Weight / Volume:	12.39 g	
			Solids / Lipids:	79.8	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-349		Instrument:	HRMS1	
Sample ID:	G296-349-4B		Filename:	a31jan07a_3-7	
Collection Date/Time:	01/11/07	10:24	Retchk:	a31jan07a_2-14	
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a31jan07a_2-14	
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14	
Analysis Date/Time:	02/01/07	5:37	Initial Cal:	m8290-071006e	

VALUE CHANGE

Method 8290
54SB83C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.55	77.6	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.91	95.3	34:09	1.57	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.65	82.7	36:49	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.42	71.0	40:07	1.04	
13C12-OCDD	4.0	2.30	57.6	44:22	0.89	
13C12-2,3,7,8-TCDF	2.0	1.99	99.7	30:39	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.64	82.0	33:21	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.75	87.4	36:07	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.56	78.0	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.378	94.6	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.436	109	33:58	1.58	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.377	94.2	36:45	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.407	102	36:01	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.326	81.6	40:49	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB83C		Weight / Volume:	12.39 g
			Solids / Lipids:	79.8 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-349		Instrument:	HRMS1
Sample ID:	G296-349-4B		Filename:	a31jan07a_3-7
Collection Date/Time:	01/11/07	10:24	Retchk:	a31jan07a_2-14
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a31jan07a_2-14
Extraction Date:	01/26/07		End ConCal:	a31jan07a_3-14
Analysis Date/Time:	02/01/07	5:37	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JWO
Date: 02-07-07

Reviewed by: MRD
Date: 2/9/07

Method 8290
54SB38A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	~~ND EMPC~~	0.102	~~0.121~~	31:15	0.32	*	A
1,2,3,7,8-PeCDD	~~ND EMPC~~	0.511	~~0.225~~	34:06	0.61	*	A
1,2,3,4,7,8-HxCDD	0.319			36:40	1.34		A
1,2,3,6,7,8-HxCDD	0.666			36:46	1.25		A
1,2,3,7,8,9-HxCDD	0.701			37:00	1.25		A
1,2,3,4,6,7,8-HpCDD	25.6			40:03	1.04		
OCDD	766			44:15	0.89		
2,3,7,8-TCDF	0.554 J,Z			30:33	0.78		A
1,2,3,7,8-PeCDF	EMPC	0.511	0.151 J,W	33:18	1.88	*	A
2,3,4,7,8-PeCDF	0.217 B,Z			33:55	1.68		A
1,2,3,4,7,8-HxCDF	0.239			35:58	1.34		A
1,2,3,6,7,8-HxCDF	0.190			36:04	1.27		A
2,3,4,6,7,8-HxCDF	0.219			36:33	1.14		A
1,2,3,7,8,9-HxCDF	0.0879			37:21	1.18		A
1,2,3,4,6,7,8-HpCDF	2.88			38:48	1.11		A
1,2,3,4,7,8,9-HpCDF	0.180			40:42	1.01		A
OCDF	8.32			44:31	0.87		A
Total TCDDs	0.349		3.44				
Total PeCDDs	0.717		1.32				
Total HxCDDs	7.80		8.10				
Total HpCDDs	56.3						
Total TCDFs	3.45		3.60				
Total PeCDFs	2.02		2.17				
Total HxCDFs	3.64						
Total HpCDFs	8.62		8.72				
WHO-2005 TEQ (ND=0)	0.882		1.23				
WHO-2005 TEQ (ND=½)	1.20		1.23				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB38A		Weight / Volume:	12.50	g
			Solids / Lipids:	78.3	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-349		Instrument:	HRMS1	
Sample ID:	G296-349-5B		Filename:	a03feb07b_2-2	
Collection Date/Time:	01/11/07	11:35	Retchk:	a03feb07b-15	
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a03feb07b-15	
Extraction Date:	01/26/07		End ConCal:	a03feb07b_2-14	
Analysis Date/Time:	02/04/07	8:41	Initial Cal:	m8290-071006e	

VALUE CHANGE

Method 8290
54SB38A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.62	80.9	31:13	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.57	78.7	34:04	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.76	87.9	36:45	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.70	85.1	40:01	1.05	
13C12-OCDD	4.0	3.50	87.6	44:13	0.90	
13C12-2,3,7,8-TCDF	2.0	1.90	94.9	30:31	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.60	80.1	33:16	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.78	89.2	36:03	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.79	89.7	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.381	95.4	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.362	90.6	33:54	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.372	93.0	36:40	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.418	105	35:58	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.386	96.5	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB38A		Weight / Volume:	12.50 g
			Solids / Lipids:	78.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-349		Instrument:	HRMS1
Sample ID:	G296-349-5B		Filename:	a03feb07b_2-2
Collection Date/Time:	01/11/07	11:35	Retchk:	a03feb07b-15
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a03feb07b-15
Extraction Date:	01/26/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	8:41	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JW
Date: 02-07-07

Reviewed by: DRD
Date: 2/7/07

Method 8290
54SB38B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.226				
1,2,3,7,8-PeCDD	ND	0.465				
1,2,3,4,7,8-HxCDD	ND	0.465				
1,2,3,6,7,8-HxCDD	ND	0.465				
1,2,3,7,8,9-HxCDD	ND	0.465				
1,2,3,4,6,7,8-HpCDD	2.01			40:03	1.00	A
OCDD	152			44:15	0.89	
2,3,7,8-TCDF	0.394 B,Z			30:33	0.70	A
1,2,3,7,8-PeCDF	ND	0.465				
2,3,4,7,8-PeCDF	ND	0.465				
1,2,3,4,7,8-HxCDF	ND	0.465				
1,2,3,6,7,8-HxCDF	ND	0.465				
2,3,4,6,7,8-HxCDF	ND	0.465				
1,2,3,7,8,9-HxCDF	ND	0.465				
1,2,3,4,6,7,8-HpCDF	ND	0.465				
1,2,3,4,7,8,9-HpCDF	ND	0.465				
OCDF	ND	1.73				
Total TCDDs	ND	0.226				
Total PeCDDs	ND	0.465				
Total HxCDDs	ND	0.465	0.418			
Total HpCDDs	6.47					
Total TCDFs	0.727 B,Z		0.833			
Total PeCDFs	ND	0.465				
Total HxCDFs	ND	0.465				
Total HpCDFs	ND	0.465				
WHO-2005 TEQ (ND=0)	0.105		0.105			
WHO-2005 TEQ (ND=½)	0.694		0.694			

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB38B		Weight / Volume:	13.37	g
			Solids / Lipids:	80.5	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-349		Instrument:	HRMS1	
Sample ID:	G296-349-6B		Filename:	a03feb07b_2-3	
Collection Date/Time:	01/11/07	11:42	Retchk:	a03feb07b-15	
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a03feb07b-15	
Extraction Date:	01/26/07		End ConCal:	a03feb07b_2-14	
Analysis Date/Time:	02/04/07	9:29	Initial Cal:	m8290-071006e	

Method 8290
54SB38B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.72	85.8	31:13	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.69	84.6	34:06	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.88	94.1	36:45	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.77	88.7	40:01	1.05	
13C12-OCDD	4.0	3.27	81.8	44:13	0.90	
13C12-2,3,7,8-TCDF	2.0	2.03	101	30:31	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.69	84.5	33:16	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.88	94.1	36:03	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.84	91.9	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.407	102	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.385	96.2	33:54	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.391	97.8	36:40	1.29	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.439	110	35:58	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.403	101	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB38B		Weight / Volume:	13.37 g
			Solids / Lipids:	80.5 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-349		Instrument:	HRMS1
Sample ID:	G296-349-6B		Filename:	a03feb07b_2-3
Collection Date/Time:	01/11/07	11:42	Retchk:	a03feb07b-15
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a03feb07b-15
Extraction Date:	01/26/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	9:29	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: [signature]
Date: 02.07.07

Reviewed by: [signature]
Date: 2/7/07

Method 8290
54SB38C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0930					
1,2,3,7,8-PeCDD	ND	0.465					
1,2,3,4,7,8-HxCDD	ND	0.465					
1,2,3,6,7,8-HxCDD	ND	0.465					
1,2,3,7,8,9-HxCDD	EMPC	0.465	0.106 J,W	37:00	1.46	*	A
1,2,3,4,6,7,8-HpCDD	3.18			40:03	1.07		A
OCDD	214			44:15	0.89		
2,3,7,8-TCDF	0.396 B,Z			30:33	0.75		A
1,2,3,7,8-PeCDF	ND	0.465					
2,3,4,7,8-PeCDF	ND	0.465					
1,2,3,4,7,8-HxCDF	ND	0.465					
1,2,3,6,7,8-HxCDF	ND	0.465					
2,3,4,6,7,8-HxCDF	ND	0.465					
1,2,3,7,8,9-HxCDF	ND	0.465					
1,2,3,4,6,7,8-HpCDF	ND	0.465					
1,2,3,4,7,8,9-HpCDF	ND	0.465					
OCDF	ND	0.930					
Total TCDDs	ND	0.0930					
Total PeCDDs	ND	0.465					
Total HxCDDs	1.24						
Total HpCDDs	9.93						
Total TCDFs	0.725 B,Z		0.842				
Total PeCDFs	ND	0.465					
Total HxCDFs	ND	0.465					
Total HpCDFs	ND	0.465					
WHO-2005 TEQ (ND=0)	0.136		0.146				
WHO-2005 TEQ (ND=½)	0.659		0.646				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB38C		Weight / Volume:	13.44	g
			Solids / Lipids:	80.0	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-349		Instrument:	HRMS1	
Sample ID:	G296-349-7B		Filename:	a03feb07b_2-4	
Collection Date/Time:	01/11/07	11:50	Retchk:	a03feb07b-15	
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a03feb07b-15	
Extraction Date:	01/26/07		End ConCal:	a03feb07b_2-14	
Analysis Date/Time:	02/04/07	10:17	Initial Cal:	m8290-071006e	

Method 8290
54SB38C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.68	84.0	31:13	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.68	83.8	34:04	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.85	92.5	36:45	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.78	88.9	40:01	1.05	
13C12-OCDD	4.0	3.45	86.3	44:13	0.89	
13C12-2,3,7,8-TCDF	2.0	1.97	98.4	30:31	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.64	82.0	33:16	1.60	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.87	93.3	36:03	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.81	90.6	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.361	90.3	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.360	90.0	33:54	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.358	89.4	36:40	1.27	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.393	98.3	35:58	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.374	93.4	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB38C		Weight / Volume:	13.44 g
			Solids / Lipids:	80.0 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-349		Instrument:	HRMS1
Sample ID:	G296-349-7B		Filename:	a03feb07b_2-4
Collection Date/Time:	01/11/07	11:50	Retchk:	a03feb07b-15
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a03feb07b-15
Extraction Date:	01/26/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	10:17	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02-07-07

Reviewed by: MEL
Date: 2/7/07

Method 8290
Dup 6
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0878					
1,2,3,7,8-PeCDD	ND	0.439					
1,2,3,4,7,8-HxCDD	ND	0.439					
1,2,3,6,7,8-HxCDD	ND ~~EMPC~~	0.439	~~0.0597~~	36:46	0.90	*	A
1,2,3,7,8,9-HxCDD	0.146			37:00	1.38		A
1,2,3,4,6,7,8-HpCDD	3.69			40:01	1.09		A
OCDD	271			44:13	0.89		
2,3,7,8-TCDF	0.351 B,Z			30:33	0.76		A
1,2,3,7,8-PeCDF	ND	0.439					
2,3,4,7,8-PeCDF	ND	0.439					
1,2,3,4,7,8-HxCDF	ND	0.439					
1,2,3,6,7,8-HxCDF	ND	0.439					
2,3,4,6,7,8-HxCDF	ND	0.439					
1,2,3,7,8,9-HxCDF	ND	0.439					
1,2,3,4,6,7,8-HpCDF	0.111 B,Z			38:46	1.13		A
1,2,3,4,7,8,9-HpCDF	ND	0.439					
OCDF	0.481			44:31	0.90		A
Total TCDDs	ND	0.0878					
Total PeCDDs	ND	0.439					
Total HxCDDs	1.34						
Total HpCDDs	11.2						
Total TCDFs	0.688 B,Z		0.788				
Total PeCDFs	ND	0.439					
Total HxCDFs	ND	0.439	0.0720				
Total HpCDFs	0.191 B,Z						
WHO-2005 TEQ (ND=0)	0.169		0.175				
WHO-2005 TEQ (ND=½)	0.639		0.623				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	Dup 6		Weight / Volume:	14.17	g
			Solids / Lipids:	80.4	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:	G296-349		Instrument:	HRMS1	
Sample ID:	G296-349-9B		Filename:	a03feb07b_2-5	
Collection Date/Time:	01/11/07		Retchk:	a03feb07b-15	
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a03feb07b-15	
Extraction Date:	01/26/07		End ConCal:	a03feb07b_2-14	
Analysis Date/Time:	02/04/07	11:05	Initial Cal:	m8290-071006e	

VALUE CHANGE

Method 8290
Dup 6
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.69	84.4	31:13	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.68	83.8	34:04	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.83	91.5	36:45	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.76	87.8	40:01	1.05	
13C12-OCDD	4.0	3.46	86.4	44:13	0.90	
13C12-2,3,7,8-TCDF	2.0	1.98	98.8	30:31	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.64	82.1	33:16	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.85	92.7	36:03	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.80	90.2	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.372	93.0	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.365	91.3	33:54	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.362	90.6	36:40	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.392	97.9	35:57	0.54	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.370	92.5	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:58	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	Dup 6		Weight / Volume:	14.17 g
			Solids / Lipids:	80.4 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14089
Project ID:	G296-349		Instrument:	HRMS1
Sample ID:	G296-349-9B		Filename:	a03feb07b_2-5
Collection Date/Time:	01/11/07		Retchk:	a03feb07b-15
Receipt Date/Time:	01/12/07	10:15	Begin ConCal:	a03feb07b-15
Extraction Date:	01/26/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	11:05	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 02-07-07

Reviewed by: _____
Date: 2/7/07

SGS

List of Qualifiers

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* See case narrative

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation generally results in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

DATA VALIDATION WORKSHEET

PCB Congeners

Reviewer: RA
Date: 3/16/07
DV Level: II (III) IV
Review Document:
__X__ SW-846 __X__ Project QAPP/SAP __X__ NFG Region III Draft Guidance (April 2004)

Project Name: Radford s wmu5
Project Number: 11656351
Laboratory: SGS
SDG No.: G296-349
Method No.: 1668A

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 2-3 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Recommended holding time in the Method is one year. If yes, J(+)/UJ(-). No holding time or preservation requirements are promulgated by EPA for non-water matrices), use professional judgement.		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B".	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	✓	✓	

Notes: *If there are no field blanks, the narrative should include acaution to the user that field blanks were not available for review and any contamination due to field conditions or cross contamination could not be assessed.*

The MB → several positive hits POS results <5x → B,Z

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/ ± 20% for analytes analyzed by isotope dilution or +/- 35% for analytes analyzed by internal std method? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
7	~~M+2/M+4~~	1.05	0.89 1.21
8	~~M+2/M+4~~	0.89	0.76 1.02
9	~~M+2/M+4~~	~~0.77~~	~~0.65 0.89~~
~~10~~	~~M+2/M+4~~	~~0.69~~	~~0.59 0.79~~

Notes:

5.0 GC/MS Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start ~~of a 12 hour~~ and end of each analytical sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 330.9792? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Are all IPR, OPR and VER standards within the method QC limits? Results for analytes that do not meet either IPR or OPR requirements should be flagged "J"/"UJ". If analyte is not recovered for an OPR sample, results must be flagged "R" for that analyte.	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

See below

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

OPR/OPRD OK ✓

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards

		Yes	No	NA
8.1	Are internal standard recoveries for all samples within the method QC limits?If no, apply J/UJ to associated targets.	✓		
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		

Notes: The recovery of extraction std 13C-19-TrCB 19.9% <30-140% in OPR. No action, this is a QC sample.

Sample 545B57A had ion ratios for 13C-19-TrCB, 13C-208-NoCB and 13C-209-DeCB outside the method QC limits. But they were within the Region III expanded limit of +/- 25%, No action required. ✓

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?			
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓		
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.	✓		
10.4	Is the signal to noise ≥ 3 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥3 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.7	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.	✓		

Notes:

DLs raised due to DF of 5.

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
	For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.			
	For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).			

Notes: "K" flagged by lab are EMPCs. Where the ratio was outside +/- 25%) changed to NDs unless prev. flagged for MB.

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported: 0			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Results for Selected PCB Congeners by Method 1668A

Client Sample ID
Lab Method Blank

Laboratory Information			**Sample Information**		
Lab Project ID:			Matrix:	Soil	
Lab Sample ID:	LMB14070		Amount:	10.0	g
Dilution factor:	1		pH:	NA	
Collection Date/Time:			Solids/Basis:	100	/ Dry
Receipt Date/Time:			QC Batch ID:	WG14070/14057	
Extraction Date:	16-Jan-07		Filename:	b19jan07a-5	
Analysis Date/Time:	19-Jan-07	12:14	ConCal:	b19jan07a-1	
			RRT Std:	b19jan07a-2	
			Initial Cal:	m1668a-b010906d	

Analyte (Congener#)	Amount (pg/g)	EDL (pg/g)	RL (pg/g)	RT	#	Ratio	#	Qualifier
8-DiCB	3.08	0.413	4.00	10:30		1.51		J
18,30-TrCB	1.79	0.489	2.00	12:12		1.15		J
31-TrCB	4.42	0.422	3.73	15:30		1.00		
20,28-TrCB	5.82	0.390	5.48	15:46		1.11		
37-TrCB	2.11	0.375	2.46	20:02		1.05		J
52-TeCB	4.22	0.316	5.35	17:36		0.73		J
49,69-TeCB	1.69	0.265	2.00	18:07		0.64	#	J K
44,47,65-TeCB	2.92	0.293	4.41	18:41		0.85		J
61,70,74,76-TeCB	3.02	0.238	10.5	23:02		0.89	#	J K
66-TeCB	ND	0.247	4.86					U
56-TeCB	ND	0.248	3.04					U
60-TeCB	ND	0.236	2.70					U
81-TeCB	ND	0.243	2.00					U
77-TeCB	ND	0.239	1.22					U
95-PeCB	2.95	0.576	4.60	21:58		1.69		J
90,101,113-PeCB	2.56	0.512	4.38	25:32		1.38		J
99-PeCB	1.26	0.460	4.21	26:17		1.70		J
86,87,97,108,119,125-PeCB	3.23	0.500	6.00	27:01		1.86	#	J K
123-PeCB	ND	0.390	3.21					U
118-PeCB	1.52	0.379	3.07	32:15		1.26	#	J K
114-PeCB	ND	0.385	1.69					U
105-PeCB	0.654	0.421	2.06	33:57		1.55		J
126-PeCB	ND	0.467	1.67					U
145-HxCB	ND	0.424	1.41					U
135,151-HxCB	ND	0.571	2.00					U
132-HxCB	ND	0.912	2.07					U
153,168-HxCB	ND	0.693	3.29					U
129,138,163-HxCB	1.71	0.809	3.00	36:44		1.73	#	J K
158-HxCB	ND	0.575	2.14					U
128,166-HxCB	ND	0.777	2.52					U
167-HxCB	ND	0.314	1.66					U
156,157-HxCB	ND	0.404	2.00					U
169-HxCB	ND	0.354	1.43					U
187-HpCB	ND	0.615	1.33					U
183,185-HpCB	ND	1.35	3.31					U
177-HpCB	ND	1.47	2.55					U
180,193-HpCB	ND	1.21	4.57					U
170-HpCB	ND	1.49	2.50					U
189-HpCB	ND	0.379	1.00					U

Results for Selected PCB Congeners by Method 1668A

Client Sample ID
Lab Method Blank

Analyte (Congener#)	Amount (pg/g)	EDL (pg/g)	RL (pg/g)	RT #	Ratio #	Qualifier
201-OcCB	ND	0.482	1.70			U
196-OcCB	ND	0.597	1.00			U
203-OcCB	ND	0.538	2.26			U
195-OcCB	ND	1.52	1.89			U
194-OcCB	ND	1.48	2.89			U
206-NoCB	ND	0.846	1.58			U
209-DeCB	ND	0.719	1.66			U

Recovery Information

Labeled Standard	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards			(25-150%)			
13C-4-DiCB	2.00	0.705	35.3	8:26	1.73	
13C-15-DiCB	2.00	1.08	54.1	13:01	1.62	
13C-19-TrCB	2.00	0.910	45.5	10:42	1.10	
13C-37-TrCB	2.00	1.20	60.0	20:01	1.04	
13C-54-TeCB	2.00	1.01	50.5	13:16	0.80	
13C-81-TeCB	2.00	1.03	51.4	28:20	0.77	
13C-77-TeCB	2.00	1.04	52.0	29:06	0.78	
13C-104-PeCB	2.00	1.22	60.8	18:34	1.62	
13C-123-PeCB	2.00	1.18	59.2	31:46	1.61	
13C-118-PeCB	2.00	1.11	55.3	32:13	1.63	
13C-114-PeCB	2.00	1.08	53.9	32:58	1.60	
13C-105-PeCB	2.00	1.09	54.3	33:55	1.56	
13C-126-PeCB	2.00	1.14	57.2	38:28	1.60	
13C-155-HxCB	2.00	1.15	57.7	25:10	1.24	
13C-167-HxCB	2.00	1.06	53.0	41:12	1.31	
13C-156,157-HxCB	4.00	2.16	53.9	42:58	1.30	
13C-169-HxCB	2.00	1.13	56.7	48:03	1.31	
13C-188-HpCB	2.00	1.09	54.3	32:52	1.06	
13C-189-HpCB	2.00	1.18	59.0	51:57	1.10	
13C-202-OcCB	2.00	0.930	46.5	40:46	0.95	
13C-205-OcCB	2.00	1.08	54.2	56:02	0.94	
13C-208-NoCB	2.00	1.06	53.1	51:06	0.79	
13C-206-NoCB	2.00	1.02	50.9	58:47	0.77	
13C-209-DeCB	2.00	0.905	45.2	61:19	1.28	
Cleanup Standards			(30-135%)			
13C-28-TrCB	2.00	1.09	54.5	15:45	1.14	
13C-111-PeCB	2.00	1.13	56.4	29:03	1.61	
13C-178-HpCB	2.00	1.07	53.5	37:20	1.07	
Injection Standards						
13C-9-DiCB	2.00			9:50	1.62	
13C-52-TeCB	2.00			17:35	0.76	
13C-101-PeCB	2.00			25:31	1.61	
13C-138-HxCB	2.00			36:41	1.29	
13C-194-OcCB	2.00			55:16	0.92	

Analyzed By: LMP
Date: 07Feb07

Reviewed By: [signature]
Date: 2/7/07

On-going Precision and Recovery Results for PCB Congeners by Method 1668A

Client Sample ID
OPR14070

Recovery Information

Labeled Standard	Amount Spiked (ng)	Measured Amount (ng)	Percent Recovery (%) #	RT (min.) #	Ratio #	Qualifier
Extraction Standards						
			(30-140%)			
13C-4-DiCB	2.00	0.202	10.1 #	8:25	1.73	
13C-15-DiCB	2.00	0.634	31.7	13:00	1.59	
13C-19-TrCB	2.00	0.397	19.9 #	10:42	1.03	
13C-37-TrCB	2.00	1.08	54.0	19:58	1.05	
13C-54-TeCB	2.00	0.613	30.6	13:15	0.83	
13C-81-TeCB	2.00	0.995	49.7	28:18	0.77	
13C-77-TeCB	2.00	0.993	49.7	29:05	0.77	
13C-104-PeCB	2.00	0.935	46.8	18:33	1.54	
13C-123-PeCB	2.00	1.03	51.7	31:45	1.65	
13C-118-PeCB	2.00	0.955	47.8	32:12	1.66	
13C-114-PeCB	2.00	0.940	47.0	32:57	1.64	
13C-105-PeCB	2.00	1.01	50.3	33:54	1.61	
13C-126-PeCB	2.00	1.11	55.4	38:27	1.60	
13C-155-HxCB	2.00	1.12	55.8	25:08	1.22	
13C-167-HxCB	2.00	1.13	56.7	41:11	1.28	
13C-156,157-HxCB	4.00	2.16	54.0	42:57	1.26	
13C-169-HxCB	2.00	1.16	58.1	48:01	1.27	
13C-188-HpCB	2.00	1.06	53.1	32:51	1.09	
13C-189-HpCB	2.00	1.20	59.8	51:55	1.10	
13C-202-OcCB	2.00	0.938	46.9	40:44	0.93	
13C-205-OcCB	2.00	1.10	55.2	56:00	0.94	
13C-208-NoCB	2.00	1.04	52.2	51:04	0.78	
13C-206-NoCB	2.00	1.03	51.4	58:46	0.84	
13C-209-DeCB	2.00	0.916	45.8	61:18	1.14	
Cleanup Standards			(40-125%)			
13C-28-TrCB	2.00	0.984	49.2	15:44	1.06	
13C-111-PeCB	2.00	1.03	51.3	29:01	1.65	
13C-178-HpCB	2.00	1.06	53.2	37:18	1.04	
Injection Standards						
13C-9-DiCB	2.00			9:49	1.58	
13C-52-TeCB	2.00			17:33	0.79	
13C-101-PeCB	2.00			25:29	1.56	
13C-138-HxCB	2.00			36:39	1.28	
13C-194-OcCB	2.00			55:15	0.93	

Analyzed By: HMP

Date: 07Feb07

Reviewed By: [illegible]

Date: 2/7/07

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: RA
Date: 3/1/07
DV Level: II (III) IV
Review Document:
__X__ SW-846 __X__ Project QAPP/SAP __X__ NFG EPA 540-R-02-003 (August 2002) __X__ NFG Region III Draft Guidance (March 1999)

Project Name: SWMU 54
Project Number: 11605635.1
Laboratory: SGS
SDG No.: G2a6-349
Method No.: 8290

1.0 General: Chain-of-Custody

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times

		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B". (use 10X for OCDD/OCDF data) TEQ values should not be calculated for isomers flagged B.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	✓		

Notes: Aqueous and Soil MB pos hits ⇒ <5X, and <10X for OCDD B/Z
EQBK-4 pos. hits. and. field sample results either >5X or were previously flagged for MB. No more action.

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-"; by greater than 50%, "J+/R-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "N+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits	
4	M/M+2	0.77	0.65- 0.89	
5	M+2/M+4	1.55	1.32- 1.78	
6	M+2/M+2	1.24	1.05- 1.43	
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	
~~7~~	~~M+2/M+4~~	~~1.04~~	~~0.88- 1.20~~	N/A for APPIX
~~8~~	~~M+2~~	~~0.89~~	~~0.76- 1.02~~	N/A for APPIX

4.6	Was the CCV analyzed at the beginning and end ~~of every 12 hours~~ of each analytical sequence with no time limit, as per STL SOP? If no, J(+)/UJ(-) all associated samples.	✓		

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start ~~of a 12 hour~~ and end of each analytical sequence with no time limit, as per STL SOP? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed at the same frequency as calibrations that defines descriptor switching times of scan ranges? If not, make a note in DV Report.	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≤ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

OPR/OPRD was done ✓

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	✓		
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		
8.3	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	✓		

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.	✓		
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

	545B38C		Dup-6	% RPD
1,2,3,7,8,9-HxCDD	0.106	Pg/g	0.146	0K Pg/g
1,2,3,4,6,7,8-HpCDD	3.18		3.69	15% OK
OCDD	214		271	23%
OCDF	ND	EDL=0.93	0.481	OK
total H_x CDD	1.24		1.34	8% OK
total HpCDDs	9.93		11.2	12% OK

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓		
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.	✓		
10.4	Is the signal to noise ≥ 2.5 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥ 2.5 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Are the two identification peak apexs within 2 seconds for positive identifications? If not, result is reported as non-detect,	✓		
10.7	Are polychlorinated diphenyl ether (PCDPE) interferences in the PCDPE channel with a S/N ratio > 2.5 and with a RT within ± 2 seconds? If yes, qualify positive furan results I.	✓		
10.8	Was a second column confirmation used for positive 2,3,7,8-TCDF?	✓		
	If no, apply "R" to the positive 2,3,7,8-TCDF results.			
	If yes, calculate the %D between the two column results, report the lower of the two values if the %D is > 25% and qualify J.			
10.9	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.10	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes:

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
11.1	Are Isotopic ratios for a detected analyte within the following established control limits...?	✓		

# Cl ion atoms	Ion Type	Theoretical	Control Limits	RIII Expanded Limits
4	M/M+2	0.77	0.65- 0.89	0.58- 0.96
5	M+2/M+4	1.55	1.32- 1.78	1.16- 1.94
6	M+2/M+2	1.24	1.05- 1.43	0.93- 1.55
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	0.38- 0.64
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	0.33- 0.55
7	M+2/M+4	1.04	0.88- 1.2	0.78- 1.30
8	M+2	0.89	0.76- 1.02	0.67- 1.11

For positive field sample results with ion abundance ratios outside the method control limits but within the expanded RIII limits, The laboratory should report the concentration as an estimated maximum possible concentration (EMPC). Region III requires this type of result to be reported as true PCDD/PCDF isomer. The validator shall also qualify J.

For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.

For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).

11.2	RIII separates 2,3,7,8-chlorinated isomers from total isomers for each congener group and reports results as 2,3,7,8-chlorine substituted and 'Other Total' PCDD/PCDF isomers. If laboratory did not report these separate, make a note in the DV report.	✓		

Notes: EMPC within Region III expanded → J/UJ
outside changed to NDs

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis: 18			
12.1.3	Number of results rejected and not reported: 0			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%			

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.000920					
1,2,3,7,8-PeCDD	0.00102 X	5=0.0051		34.05	1.44		A
1,2,3,4,7,8-HxCDD	ND	0.00250					
1,2,3,6,7,8-HxCDD	ND	0.00250					
1,2,3,7,8,9-HxCDD	ND	0.00250					
1,2,3,4,6,7,8-HpCDD	0.00370 X	5=0.0185		39.96	1.11		A
OCDD	0.0480 X10	=0.48		44.08	0.97		A
2,3,7,8-TCDF	ND	0.000904					
1,2,3,7,8-PeCDF	0.000940 X	5=0.0047		33.22	1.37		A
2,3,4,7,8-PeCDF	EMPC	0.00250	0.000980	33.85	1.31	*	A
1,2,3,4,7,8-HxCDF	EMPC	0.00250	0.000980	35.90	0.89	*	A
1,2,3,6,7,8-HxCDF	0.00120 X	5=0.006		35.99	1.36		A
2,3,4,6,7,8-HxCDF	EMPC	0.00250	0.000720	36.49	1.04	*	A
1,2,3,7,8,9-HxCDF	ND	0.00250					
1,2,3,4,6,7,8-HpCDF	EMPC	0.00250	0.00178	38.72	1.36	*	A
1,2,3,4,7,8,9-HpCDF	EMPC	0.00250	0.000720	40.61	0.86	*	A
OCDF	EMPC	0.00500	0.00472	44.38	1.08	*	A
Total TCDDs	ND	0.000920					
Total PeCDDs	0.00102 X	5=0.0051					
Total HxCDDs	ND	0.00250					
Total HpCDDs	0.00370x5	=0.0185					
Total TCDFs	ND	0.000904					
Total PeCDFs	0.000940 X	5=0.0047	0.00192				
Total HxCDFs	0.00120 x5	=0.006	0.00290				
Total HpCDFs	ND	0.00250	0.00250				
WHO-2005 TEQ (ND=0)	0.00122		0.00171				
WHO-2005 TEQ (ND=½)	0.00288		0.00272				

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Water	
Sample ID:	Lab Method Blank		Weight / Volume:	1000	mL
			Solids / Lipids:	NA	%
			Original pH :	5	
Laboratory Information			Batch ID:	WG14080	
Project ID:			Instrument:	HRMS3	
Sample ID:			Filename:	c26jan07d_4-3	
Collection Date/Time:			Retchk:	c26jan07d_3-14	
Receipt Date/Time:			Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/22/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	3:07	Initial Cal:	m8290-c110206a	

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.253					
1,2,3,7,8-PeCDD	EMPC	0.500	0.0960	34:10	1.12	*	Q A
1,2,3,4,7,8-HxCDD	ND	0.500					
1,2,3,6,7,8-HxCDD	ND	0.500					
1,2,3,7,8,9-HxCDD	ND	0.500					
1,2,3,4,6,7,8-HpCDD	0.358 X5 =1.79			40:09	1.02		A
OCDD	2.46 X10 =24.6			44:22	0.87		A
2,3,7,8-TCDF	0.460 X5 = 2.3			30:40	0.86		A
1,2,3,7,8-PeCDF	0.112 X5 = 0.56			33:21	1.63		A
2,3,4,7,8-PeCDF	0.124 X5 = 0.62			33:58	1.51		Q A
1,2,3,4,7,8-HxCDF	ND	0.500					
1,2,3,6,7,8-HxCDF	EMPC	0.500	0.0960	36:09	1.52	*	A
2,3,4,6,7,8-HxCDF	ND	0.500					
1,2,3,7,8,9-HxCDF	ND	0.500					
1,2,3,4,6,7,8-HpCDF	0.132 X5 = 0.66			38:52	1.19		A
1,2,3,4,7,8,9-HpCDF	ND	0.500					
OCDF	ND	1.00					
Total TCDDs	ND	0.253					
Total PeCDDs	ND	0.500	0.0960				Q
Total HxCDDs	ND	0.500					
Total HpCDDs	0.664 X5 = 3.32						
Total TCDFs	0.460 X5 = 2.3		0.818				
Total PeCDFs	0.236 X5 = 1.18						Q
Total HxCDFs	0.0960 X5 = 0.48						
Total HpCDFs	0.132 X5 = 0.66						
WHO-2005 TEQ (ND=0)	0.0922		0.198				
WHO-2005 TEQ (ND=½)	0.647		0.477				

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10.0	g
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14089	
Project ID:			Instrument:	HRMS1	
Sample ID:			Filename:	a31jan07a_2-3	
Collection Date/Time:			Retchk:	a31jan07a-6	
Receipt Date/Time:			Begin ConCal:	a31jan07a-6	
Extraction Date:	01/26/07		End ConCal:	a31jan07a_2-14	
Analysis Date/Time:	01/31/07	15:12	Initial Cal:	m8290-071006e	

SGS

Case Narrative
SGS Project: **G296-349**
Project Name: **SWMU 54 RFI**

For Methods: 8290 & 1668A

- The submitted samples were accepted into the lab on January 12th, 2007 and extracted between January 16th and January 26th, 2007 by methods 3540C and 3520C. The sample extracts and associated QC extracts were then processed through clean-up by method 3630/3620 and analyzed by HRGC/HRMS for methods 8290 and 1668A.
- Sample **54SB57A** (PCB) required a 5X dilution in order to improve the quality of the data for many of the target analytes due to interferences. The dilution factor is notated on the form 1's.
- Samples **54SB57A** (PCB) has an ion ratio for ^{13}C-19-TrCB which is outside of the QC limits established by the method. This is most likely attributed to the lower signal-to-noise ratios caused by the sample dilution.

Craig R. Trohzo 2/7/07

Craig R. Trohzo Date
Data Validation/QA Officer

Secondary Review

W. Mike Larkins Date
Technical Director

Or Heather Patterson 07FEB07

Heather Patterson Date
Director

SGS

Toxic Equivalency Factors

Analyte	WHO* 1998	WHO* 2005	International-89	MADEP†
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	1	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.01	0.1
OCDD	0.0001	0.0003	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.3	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.1
OCDF	0.0001	0.0003	0.001	0.001

* World Health Organization
† Massachusetts Department of Environmental Protection

SGS

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~~066961~~ 1/11/07-6

(1)

CLIENT: HRS

CONTACT: Roshanak Aryan PHONE NO:(619 965 9000

PROJECT: SWMU 54 RFI SITE/PWSID#:

REPORTS TO: E-MAIL:

Roshanak Aryan FAX NO.:( )

INVOICE TO: QUOTE #

Roshanak Aryan P.O. NUMBER

SGS Reference: G296-349

PAGE ____ OF ____

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE C=COMP G=GRAB	(3) Analysis Required: Dioxins/Furans PCB Congeners	REMARKS
	EQBK-4	1/11/06	1470	Water	2	G	✓	
	545B83A		1012	Soil	1	G	✓	
	545B83B		1017	Soil	1	G	✓	
	545B83C		1024	Soil	1	G	✓	
	545B38A		1135	Soil	1	G	✓	
	545B38B		1142	Soil	1	G	✓	
	545B38C		1150	Soil	1	G	✓	
	545B57A		1210	Soil	1	G	✓	
	Dup 6		—	Soil	1	G	✓	

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
John Spangler	1/11/07	1730	
Relinquished By: (2)	Date	Time	Received By:
	1/12/07	1015	Amy DiLaney
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier: FedEx

Shipping Ticket No: 8600 1563 5550

Samples Received Cold? (Circle) YES NO

Temperature °C: 1.5 °F ____

Special Deliverable Requirements:

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-350 **Fraction:** Dioxin/Furans

Lab: Paradigm Analytical **Project Name** Radford SWMU 54

Reviewer: RA **Date:** February 19, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The aqueous method blank displayed positive detections for 1,2,3,7,8-PeCDD at 0.00102 ng/L, 1,2,3,4,6,7,8-HpCDD at 0.0037 ng/L, OCDD at 0.048 ng/L, 1,2,3,7,8-PeCDF at 0.00094 ng/L, 1,2,3,6,7,8-HxCDF at 0.0012 ng/L, total PeCDDs at 0.00102 ng/L, total HpCDDs at 0.0037 ng/L, total PeCDFs at 0.00094 ng/L, and total HxCDFs at 0.0012 ng/L. The associated equipment blank result for OCDD was less than ten times the method blank concentration and was flagged "B,z". The associated equipment blank results less than five times the method blank concentration for the other affected compounds were also flagged "B,z".

The soil method blank displayed positive detections for 1,2,3,4,6,7,8-HpCDD at 0.384 pg/g, OCDD at 2.89 pg/g, 2,3,7,8-TCDF at 0.358 pg/g, 1,2,3,7,8-PeCDF at 0.110 pg/g, 2,3,4,7,8-PeCDF at 0.102 pg/g, total HpCDDs at 0.384 pg/g, total TCDFs at 0.564 pg/g, and total PeCDFs at 0.212 pg/g. Positive associated field sample results for OCDD were greater than ten times the method blank concentration and no data qualifying action was necessary. Positive associated field sample results less than five times the method blank concentration for the other affected compounds were flagged "B,z".

The matrix spike analyzed for sample 54SB82B displayed a percent recovery greater than the upper control limit of 125% for OCDD at 134%. This matrix spike pair also displayed a relative percent difference greater than the control limit of 20% for OCDD at 21.4%. The associated parent sample results was positive and was flagged "J,m".

Several samples displayed detections reported by the laboratory as estimated maximum possible concentrations (EMPCs). In cases where the EMPC displayed an ion abundance ratio outside the method criterion of a theoretical ratio +/- 15% but within the EPA Region III criterion of +/- 25%, the EMPC was qualified as "J,w". In cases where the EMPC displayed an ion abundance ratio greater than the EPA Region III criterion of +/- 25%, the EMPC was changed to a non-detect.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed. It should be noted that detection limits were raised in several samples due to dilutions.

Signed: Rajan

Paradigm Analytical Laboratories

Cust Proj ID: 11656531
Client Name: URS

G296-350

Due Date: 2007-02-05 17:00:00
Login Date: 2007-01-15 09:59:54

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G296-350-1	A	54SB23A	STD	2007-01-12 09:18:00	2007-01-13	2007-02-05	Soil	W2	Full	8290	LG::REVW
G296-350-2	A	54SB23B	STD	2007-01-12 09:23:00	2007-01-13	2007-02-05	Soil	W2	Full	8290	LG::REVW
G296-350-3	A	54SB23C	STD	2007-01-12 09:28:00	2007-01-13	2007-02-05	Soil	W2	Full	8290	LG::REVW
G296-350-4	A	54SB82A	STD	2007-01-12 10:05:00	2007-01-13	2007-02-05	Soil	W2	Full	8290	LG::REVW
G296-350-5	A	54SB82B	STD	2007-01-12 10:10:00	2007-01-13	2007-02-05	Soil	W2	Full	8290	LG::REVW
G296-350-6	A	54SB82B MS	STD	2007-01-12 10:10:00	2007-01-13	2007-02-05	Soil	W2	Full	8290	LG::REVW
G296-350-7	A	54SB82B MSD	STD	2007-01-12 10:10:00	2007-01-13	2007-02-05	Soil	W2	Full	8290	LG::REVW
G296-350-8	A	54SB82C	STD	2007-01-12 10:15:00	2007-01-13	2007-02-05	Soil	W2	Full	8290	LG::REVW
G296-350-9	A	Dup 7	STD	2007-01-12 10:15:00	2007-01-13	2007-02-05	Soil	W2	Full	8290	LG::REVW
G296-350-10	A	EQBK-6	STD	2007-01-12 12:20:00	2007-01-13	2007-02-05	Water	W2	Full	8290	LG::REVW
	B					2007-02-05	Water	W2	Full	8290	LG::REVW

DUPS

7

Method 8290
54SB23A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	EMPC	0.107	0.204 J,W	31:15	0.62	*	A
1,2,3,7,8-PeCDD	ND	0.536					
1,2,3,4,7,8-HxCDD	0.109			36:40	1.33		A
1,2,3,6,7,8-HxCDD	0.142			36:46	1.35		A
1,2,3,7,8,9-HxCDD	0.215			37:00	1.29		A
1,2,3,4,6,7,8-HpCDD	6.12			40:03	1.04		
OCDD	326			44:13	0.90		
2,3,7,8-TCDF	0.440 B, Z			30:33	0.82		A
1,2,3,7,8-PeCDF	EMPC	0.536	0.0880 J,W	33:18	1.20	*	A
2,3,4,7,8-PeCDF	0.103 B, Z			33:55	1.39		A
1,2,3,4,7,8-HxCDF	ND	0.536					
1,2,3,6,7,8-HxCDF	ND	0.536					
2,3,4,6,7,8-HxCDF	ND	0.536					
1,2,3,7,8,9-HxCDF	ND	0.536					
1,2,3,4,6,7,8-HpCDF	0.322			38:48	1.13		A
1,2,3,4,7,8,9-HpCDF	ND	0.536					
OCDF	0.491			44:31	0.87		A
Total TCDDs	ND	0.107	0.204				
Total PeCDDs	0.313						
Total HxCDDs	2.30		2.44				
Total HpCDDs	16.7						
Total TCDFs	0.989 B, Z		1.22				
Total PeCDFs	0.487 B, Z		0.575				
Total HxCDFs	0.341						
Total HpCDFs	0.558						
WHO-2005 TEQ (ND=0)	0.284		0.491				
WHO-2005 TEQ (ND=½)	0.724		0.869				

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB23A		Weight / Volume:	11.22 g
			Solids / Lipids:	83.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:	G296-350		Instrument:	HRMS1
Sample ID:	G296-350-1B		Filename:	a03feb07b_2-6
Collection Date/Time:	01/12/07	9:18	Retchk:	a03feb07b-15
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	11:53	Initial Cal:	m8290-071006e

Method 8290
54SB23A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.56	78.0	31:13	0.79	
13C12-1,2,3,7,8-PeCDD	2.0	1.50	75.2	34:04	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.64	82.1	36:45	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.61	80.4	40:01	1.05	
13C12-OCDD	4.0	3.15	78.8	44:13	0.90	
13C12-2,3,7,8-TCDF	2.0	1.80	90.1	30:31	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.49	74.4	33:16	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.69	84.6	36:03	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.65	82.5	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.332	83.1	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.319	79.7	33:54	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.308	77.0	36:40	1.24	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.356	89.1	35:58	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.325	81.1	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB23A		Weight / Volume:	11.22 g
			Solids / Lipids:	83.1 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:	G296-350		Instrument:	HRMS1
Sample ID:	G296-350-1B		Filename:	a03feb07b_2-6
Collection Date/Time:	01/12/07	9:18	Retchk:	a03feb07b-15
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	11:53	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 02/12/07

Reviewed by: _____
Date: 2/12/07

Method 8290
54SB23B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.243				
1,2,3,7,8-PeCDD	ND	0.476				
1,2,3,4,7,8-HxCDD	ND	0.476				
1,2,3,6,7,8-HxCDD	ND	0.476				
1,2,3,7,8,9-HxCDD	ND	0.476				
1,2,3,4,6,7,8-HpCDD	2.94			40:03	0.94	A
OCDD	156			44:15	0.89	
2,3,7,8-TCDF	0.488 B7 Z			30:33	0.86	A
1,2,3,7,8-PeCDF	ND	0.476				
2,3,4,7,8-PeCDF	ND	0.476				
1,2,3,4,7,8-HxCDF	ND	0.476				
1,2,3,6,7,8-HxCDF	ND	0.476				
2,3,4,6,7,8-HxCDF	ND	0.476				
1,2,3,7,8,9-HxCDF	ND	0.476				
1,2,3,4,6,7,8-HpCDF	ND	0.476				
1,2,3,4,7,8,9-HpCDF	ND	0.476				
OCDF	ND	0.952				
Total TCDDs	ND	0.243				
Total PeCDDs	ND	0.476				
Total HxCDDs	ND	0.476	0.438			
Total HpCDDs	8.04					
Total TCDFs	0.836 B7 Z		0.970			
Total PeCDFs	ND	0.476				
Total HxCDFs	ND	0.476				
Total HpCDFs	ND	0.476				
WHO-2005 TEQ (ND=0)	0.125		0.125			
WHO-2005 TEQ (ND=½)	0.735		0.735			

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB23B		Weight / Volume:	12.76 g
			Solids / Lipids:	82.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:	G296-350		Instrument:	HRMS1
Sample ID:	G296-350-2B		Filename:	a03feb07b_2-7
Collection Date/Time:	01/12/07	9:23	Retchk:	a03feb07b-15
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	12:40	Initial Cal:	m8290-071006e

Method 8290
54SB23B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.58	79.1	31:13	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.60	79.8	34:06	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.73	86.6	36:45	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.66	82.9	40:01	1.05	
13C12-OCDD	4.0	3.25	81.2	44:13	0.89	
13C12-2,3,7,8-TCDF	2.0	1.87	93.5	30:31	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.56	77.8	33:16	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.79	89.6	36:03	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.70	85.1	38:46	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.329	82.2	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.340	84.9	33:54	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.314	78.4	36:40	1.29	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.348	86.9	35:58	0.55	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.328	81.9	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB23B		Weight / Volume:	12.76 g
			Solids / Lipids:	82.3 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:	G296-350		Instrument:	HRMS1
Sample ID:	G296-350-2B		Filename:	a03feb07b_2-7
Collection Date/Time:	01/12/07	9:23	Retchk:	a03feb07b-15
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	12:40	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 02-12-07

Reviewed by: MLP
Date: 2/12/07

Method 8290
54SB23C
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.288				
1,2,3,7,8-PeCDD	ND	0.517				
1,2,3,4,7,8-HxCDD	ND	0.517				
1,2,3,6,7,8-HxCDD	ND	0.517				
1,2,3,7,8,9-HxCDD	ND	0.517				
1,2,3,4,6,7,8-HpCDD	2.95			40:03	1.02	A
OCDD	169			44:15	0.88	
2,3,7,8-TCDF	0.571 B,Z			30:33	0.79	A
1,2,3,7,8-PeCDF	ND	0.517				
2,3,4,7,8-PeCDF	ND	0.517				
1,2,3,4,7,8-HxCDF	ND	0.517				
1,2,3,6,7,8-HxCDF	ND	0.517				
2,3,4,6,7,8-HxCDF	ND	0.517				
1,2,3,7,8,9-HxCDF	ND	0.517				
1,2,3,4,6,7,8-HpCDF	ND	0.517				
1,2,3,4,7,8,9-HpCDF	ND	0.517				
OCDF	ND	1.03				
Total TCDDs	ND	0.288				
Total PeCDDs	ND	0.517				
Total HxCDDs	1.13					
Total HpCDDs	8.21					
Total TCDFs	1.01 B,Z		1.15			
Total PeCDFs	ND	0.517				
Total HxCDFs	ND	0.517				
Total HpCDFs	ND	0.517				
WHO-2005 TEQ (ND=0)	0.137		0.137			
WHO-2005 TEQ (ND=½)	0.811		0.811			

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB23C		Weight / Volume:	11.59 g
			Solids / Lipids:	83.5 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:	G296-350		Instrument:	HRMS1
Sample ID:	G296-350-3B		Filename:	a03feb07b_2-8
Collection Date/Time:	01/12/07	9:28	Retchk:	a03feb07b-15
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	13:28	Initial Cal:	m8290-071006e

Method 8290
54SB23C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.57	78.3	31:13	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.56	78.1	34:06	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.72	86.0	36:46	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.66	83.0	40:01	1.06	
13C12-OCDD	4.0	3.13	78.2	44:13	0.89	
13C12-2,3,7,8-TCDF	2.0	1.87	93.4	30:31	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.52	76.0	33:16	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.81	90.6	36:04	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.73	86.3	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.322	80.4	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.323	80.8	33:54	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.346	86.5	36:40	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.358	89.6	35:58	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.320	80.0	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB23C		Weight / Volume:	11.59 g
			Solids / Lipids:	83.5 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:	G296-350		Instrument:	HRMS1
Sample ID:	G296-350-3B		Filename:	a03feb07b_2-8
Collection Date/Time:	01/12/07	9:28	Retchk:	a03feb07b-15
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	13:28	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 02.12.07

Reviewed by: _____
Date: 2/20/07

Method 8290
54SB82A
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.0997				
1,2,3,7,8-PeCDD	ND	0.498				
1,2,3,4,7,8-HxCDD	ND	0.498				
1,2,3,6,7,8-HxCDD	ND	0.498				
1,2,3,7,8,9-HxCDD	ND	0.498				
1,2,3,4,6,7,8-HpCDD	1.87 B7Z			40:03	1.16	A
OCDD	122			44:15	0.89	
2,3,7,8-TCDF	0.463 B7Z			30:33	0.82	A
1,2,3,7,8-PeCDF	0.0738 B7Z			33:18	1.61	A
2,3,4,7,8-PeCDF	0.0957 B7Z			33:54	1.37	A
1,2,3,4,7,8-HxCDF	ND	0.498				
1,2,3,6,7,8-HxCDF	ND	0.498				
2,3,4,6,7,8-HxCDF	ND	0.498				
1,2,3,7,8,9-HxCDF	ND	0.498				
1,2,3,4,6,7,8-HpCDF	0.114			38:46	0.95	A
1,2,3,4,7,8,9-HpCDF	ND	0.498				
OCDF	ND	0.997				
Total TCDDs	ND	0.0997				
Total PeCDDs	ND	0.498				
Total HxCDDs	0.510		0.742			
Total HpCDDs	5.92					
Total TCDFs	0.947 B7Z		1.13			
Total PeCDFs	0.403 B7Z					
Total HxCDFs	0.118					
Total HpCDFs	0.209					
WHO-2005 TEQ (ND=0)	0.134		0.134			
WHO-2005 TEQ (ND=½)	0.610		0.610			

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB82A		Weight / Volume:	12.28 g
			Solids / Lipids:	81.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:	G296-350		Instrument:	HRMS1
Sample ID:	G296-350-4B		Filename:	a03feb07b_2-9
Collection Date/Time:	01/12/07	10:05	Retchk:	a03feb07b-15
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	14:16	Initial Cal:	m8290-071006e

Method 8290
54SB82A
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.49	74.6	31:13	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.46	73.2	34:04	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.62	80.9	36:45	1.22	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.57	78.4	40:01	1.06	
13C12-OCDD	4.0	2.93	73.2	44:13	0.89	
13C12-2,3,7,8-TCDF	2.0	1.74	86.8	30:31	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.46	72.9	33:16	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.70	84.8	36:04	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.63	81.5	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.310	77.6	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.297	74.2	33:54	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.319	79.7	36:40	1.40	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.341	85.3	35:58	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.313	78.3	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB82A		Weight / Volume:	12.28 g
			Solids / Lipids:	81.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:	G296-350		Instrument:	HRMS1
Sample ID:	G296-350-4B		Filename:	a03feb07b_2-9
Collection Date/Time:	01/12/07	10:05	Retchk:	a03feb07b-15
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	14:16	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JMP
Date: 02/12/07

Reviewed by: MM
Date: 2/12/07

Method 8290
54SB82B
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.0949					
1,2,3,7,8-PeCDD	0.0683			34:06	1.42		A
1,2,3,4,7,8-HxCDD	~~EMPC~~ ND	0.474	~~0.0778~~ 1	36:40	1.66	*	A
1,2,3,6,7,8-HxCDD	0.123			36:46	1.30		A
1,2,3,7,8,9-HxCDD	0.184			37:00	1.30		A
1,2,3,4,6,7,8-HpCDD	4.00			40:03	1.02		A
OCDD	251 J, M			44:13	0.90		
2,3,7,8-TCDF	0.414 B, Z			30:33	0.81		A
1,2,3,7,8-PeCDF	EMPC	0.474	0.0759 J, W 2	33:18	1.15	*	A
2,3,4,7,8-PeCDF	0.144 B, Z			33:55	1.73		A
1,2,3,4,7,8-HxCDF	0.0531			35:58	1.16		A
1,2,3,6,7,8-HxCDF	EMPC	0.474	0.0436 J, W	36:04	1.48	*	A
2,3,4,6,7,8-HxCDF	0.116			36:33	1.24		A
1,2,3,7,8,9-HxCDF	0.0626			37:21	1.25		A
1,2,3,4,6,7,8-HpCDF	0.275			38:48	1.07		A
1,2,3,4,7,8,9-HpCDF	ND	0.474					
OCDF	ND	0.949					
Total TCDDs	0.0949		0.269				
Total PeCDDs	0.675		0.766				
Total HxCDDs	2.05						
Total HpCDDs	11.2						
Total TCDFs	1.64 B, Z		1.95				
Total PeCDFs	1.12		1.19				
Total HxCDFs	0.727						
Total HpCDFs	0.275						
WHO-2005 TEQ (ND=0)	0.325		0.339				
WHO-2005 TEQ (ND=½)	0.429		0.389				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB82B		Weight / Volume:	13.23 g	
			Solids / Lipids:	79.7	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14092	
Project ID:	G296-350		Instrument:	HRMS1	
Sample ID:	G296-350-5B		Filename:	a03feb07b_2-10	
Collection Date/Time:	01/12/07	10:10	Retchk:	a03feb07b-15	
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15	
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14	
Analysis Date/Time:	02/04/07	15:04	Initial Cal:	m8290-071006e	

1 → ion ratio > 25% → ND
2 → ion ratio < 25% → J, W

VALUE CHANGE

Method 8290
54SB82B
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.65	82.4	31:13	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.61	80.7	34:04	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.84	91.8	36:45	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.74	86.9	40:01	1.05	
13C12-OCDD	4.0	3.47	86.7	44:13	0.89	
13C12-2,3,7,8-TCDF	2.0	1.89	94.4	30:31	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.56	78.2	33:16	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.90	95.2	36:03	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.82	90.9	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.340	85.1	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.323	80.7	33:54	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.335	83.8	36:40	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.358	89.4	35:57	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.345	86.2	40:42	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Soil
Sample ID:	54SB82B		Weight / Volume:	13.23 g
			Solids / Lipids:	79.7 %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:	G296-350		Instrument:	HRMS1
Sample ID:	G296-350-5B		Filename:	a03feb07b_2-10
Collection Date/Time:	01/12/07	10:10	Retchk:	a03feb07b-15
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14
Analysis Date/Time:	02/04/07	15:04	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.08]Report

Analyzed by: JWS
Date: 020907

Reviewed by:
Date: 2/9/07

Method 8290
54SB82BC
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.136					
1,2,3,7,8-PeCDD	EMPC	0.568	0.0931 J,W	34:06	1.30	*	A
1,2,3,4,7,8-HxCDD	0.109			36:40	1.20		A
1,2,3,6,7,8-HxCDD	2 0.154			36:46	1.18		A
1,2,3,7,8,9-HxCDD	2 ND ~~EMPC~~	0.568	~~0.268~~ e	37:00	1.81	*	A
1,2,3,4,6,7,8-HpCDD	5.87			40:03	1.06		
OCDD	364			44:15	0.89		
2,3,7,8-TCDF	0.454 B,Z			30:33	0.81		A
1,2,3,7,8-PeCDF	EMPC	0.568	0.104 J,W	33:18	1.89	*	A
2,3,4,7,8-PeCDF	EMPC	0.568	0.107 J,W	33:55	1.30	*	A
1,2,3,4,7,8-HxCDF	ND	0.568					
1,2,3,6,7,8-HxCDF	ND	0.568					
2,3,4,6,7,8-HxCDF	ND	0.568					
1,2,3,7,8,9-HxCDF	ND	0.568					
1,2,3,4,6,7,8-HpCDF	0.218			38:46	1.05		A
1,2,3,4,7,8,9-HpCDF	ND	0.568					
OCDF	0.375			44:31	0.89		A
Total TCDDs	ND	0.136					
Total PeCDDs	ND	0.568	0.223				
Total HxCDDs	1.77		2.52				
Total HpCDDs	16.1						
Total TCDFs	0.952 B,Z		1.06				
Total PeCDFs	ND	0.568	0.211				
Total HxCDFs	0.125						
Total HpCDFs	0.370						
WHO-2005 TEQ (ND=0)	0.242		0.397				
WHO-2005 TEQ (ND=½)	0.832		0.581				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB82BC		Weight / Volume:	11.27 g	
			Solids / Lipids:	78.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14092	
Project ID:	G296-350		Instrument:	HRMS1	
Sample ID:	G296-350-8B		Filename:	a03feb07b_2-13	
Collection Date/Time:	01/12/07	10:15	Retchk:	a03feb07b-15	
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15	
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14	
Analysis Date/Time:	02/04/07	17:28	Initial Cal:	m8290-071006e	

1 ion ratio <25% → J,W
2 ion ratio >25% → ND

VALUE CHANGE

Method 8290
54SB82C
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.59	79.5	31:13	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.55	77.4	34:06	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.77	88.3	36:45	1.24	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.68	83.8	40:01	1.05	
13C12-OCDD	4.0	3.35	83.7	44:13	0.89	
13C12-2,3,7,8-TCDF	2.0	1.86	92.9	30:31	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.55	77.4	33:16	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.78	89.1	36:03	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.73	86.5	38:46	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.319	79.8	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.306	76.5	33:54	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.305	76.2	36:40	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.341	85.3	35:58	0.55	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.325	81.2	40:40	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.25	

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	54SB82C		Weight / Volume:	11.27 g	
			Solids / Lipids:	78.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14092	
Project ID:	G296-350		Instrument:	HRMS1	
Sample ID:	G296-350-8B		Filename:	a03feb07b_2-13	
Collection Date/Time:	01/12/07	10:15	Retchk:	a03feb07b-15	
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a03feb07b-15	
Extraction Date:	01/29/07		End ConCal:	a03feb07b_2-14	
Analysis Date/Time:	02/04/07	17:28	Initial Cal:	m8290-071006e	

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 02/12/07

Reviewed by: _____
Date: 2/13/07

Method 8290
Dup 7
URS

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.101					
1,2,3,7,8-PeCDD	0.0789			34:06	1.69		A
1,2,3,4,7,8-HxCDD	0.0749			36:40	1.36		A
1,2,3,6,7,8-HxCDD	1 ND ~~EMPC~~	0.506	~~0.127~~ Q	36:46	1.59	*	A
1,2,3,7,8,9-HxCDD	0.229			37:00	1.18		A
1,2,3,4,6,7,8-HpCDD	5.49			40:01	1.04		
OCDD	405			44:13	0.89		
2,3,7,8-TCDF	0.425 B,Z			30:33	0.82		A
1,2,3,7,8-PeCDF	2 EMPC	0.506	0.0728 J,W	33:16	1.22	*	A
2,3,4,7,8-PeCDF	0.115 B,Z			33:54	1.43		A
1,2,3,4,7,8-HxCDF	ND ~~EMPC~~	0.506	~~0.0587~~ Q	35:58	1.90	*	A
1,2,3,6,7,8-HxCDF	EMPC	0.506	0.0567 J,W	36:03	1.47	*	A
2,3,4,6,7,8-HxCDF	0.0830			36:33	1.40		A
1,2,3,7,8,9-HxCDF	0.0850			37:19	1.22		A
1,2,3,4,6,7,8-HpCDF	0.233			38:46	1.02		A
1,2,3,4,7,8,9-HpCDF	ND	0.506					
OCDF	ND	1.01					
Total TCDDs	0.0951		0.271				
Total PeCDDs	0.544						
Total HxCDDs	2.71		2.83				
Total HpCDDs	16.3						
Total TCDFs	1.51 B,Z		1.73				
Total PeCDFs	0.605 B,Z		0.927				
Total HxCDFs	0.660						
Total HpCDFs	0.233						
WHO-2005 TEQ (ND=0)	0.382		0.408				
WHO-2005 TEQ (ND=½)	0.519		0.462				

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	Dup 7		Weight / Volume:	12.49 g	
			Solids / Lipids:	79.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14092	
Project ID:	G296-350		Instrument:	HRMS1	
Sample ID:	G296-350-9B		Filename:	a05feb07b-6	
Collection Date/Time:	01/12/07	10:15	Retchk:	a05feb07b-1	
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a05feb07b-1	
Extraction Date:	01/29/07		End ConCal:	a05feb07b-15	
Analysis Date/Time:	02/05/07	14:50	Initial Cal:	m8290-071006e	

1 → ion ratio 725% → ND
2 → ion ratio <25% → J,W

VALUE CHANGE

Method 8290
Dup 7
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.66	83.2	31:13	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.66	82.8	34:04	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.84	91.9	36:45	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.73	86.7	40:01	1.06	
13C12-OCDD	4.0	3.42	85.5	44:13	0.90	
13C12-2,3,7,8-TCDF	2.0	2.02	101	30:31	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.64	82.1	33:16	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.90	95.1	36:03	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.84	92.1	38:46	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.347	86.7	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.347	86.9	33:54	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.314	78.5	36:40	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.377	94.2	35:57	0.52	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.350	87.4	40:42	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.24	

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Soil	
Sample ID:	Dup 7		Weight / Volume:	12.49 g	
			Solids / Lipids:	79.1	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14092	
Project ID:	G296-350		Instrument:	HRMS1	
Sample ID:	G296-350-9B		Filename:	a05feb07b-6	
Collection Date/Time:	01/12/07	10:15	Retchk:	a05feb07b-1	
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a05feb07b-1	
Extraction Date:	01/29/07		End ConCal:	a05feb07b-15	
Analysis Date/Time:	02/05/07	14:50	Initial Cal:	m8290-071006e	

Form Version:[8290_DB_2.08]Report

Analyzed by: _____
Date: 02.12.07

Reviewed by: _____
Date: 2/13/07

Method 8290
EQBK-6
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00122				
1,2,3,7,8-PeCDD	ND	0.00259				
1,2,3,4,7,8-HxCDD	ND	0.00259				
1,2,3,6,7,8-HxCDD	ND	0.00259				
1,2,3,7,8,9-HxCDD	ND	0.00259				
1,2,3,4,6,7,8-HpCDD	ND	0.00259				
OCDD	0.00680 BJ Z			44:13	0.87	A
2,3,7,8-TCDF	ND	0.00102				
1,2,3,7,8-PeCDF	0.00104 BJ Z			33:16	1.70	A
2,3,4,7,8-PeCDF	0.000892			33:54	1.62	A
1,2,3,4,7,8-HxCDF	ND	0.00259				
1,2,3,6,7,8-HxCDF	ND	0.00259				
2,3,4,6,7,8-HxCDF	ND	0.00259				
1,2,3,7,8,9-HxCDF	ND	0.00259				
1,2,3,4,6,7,8-HpCDF	ND	0.00259				
1,2,3,4,7,8,9-HpCDF	ND	0.00259				
OCDF	ND	0.00519				
Total TCDDs	ND	0.00122				
Total PeCDDs	ND	0.00259				
Total HxCDDs	ND	0.00259				
Total HpCDDs	ND	0.00259				
Total TCDFs	ND	0.00102				
Total PeCDFs	0.00193 BJ Z					
Total HxCDFs	ND	0.00259				
Total HpCDFs	ND	0.00259				
WHO-2005 TEQ (ND=0)	0.000301		0.000301			
WHO-2005 TEQ (ND=½)	0.00321		0.00321			

Client Information			**Sample Information**	
Project Name:	SWMU 54 RFI		Report Basis:	
			Matrix:	Water
Sample ID:	EQBK-6		Weight / Volume:	964 mL
			Solids / Lipids:	NA %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14080
Project ID:	G296-350		Instrument:	HRMS1
Sample ID:	G296-350-10C		Filename:	a05feb07b-7
Collection Date/Time:	01/12/07	12:20	Retchk:	a05feb07b-1
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a05feb07b-1
Extraction Date:	01/22/07		End ConCal:	a05feb07b-15
Analysis Date/Time:	02/05/07	15:38	Initial Cal:	m8290-071006e

Method 8290
EQBK-6
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.58	79.2	31:13	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.67	83.5	34:04	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.81	90.6	36:45	1.22	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.63	81.7	40:01	1.05	
13C12-OCDD	4.0	2.68	67.1	44:13	0.90	
13C12-2,3,7,8-TCDF	2.0	1.91	95.3	30:31	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.64	82.1	33:16	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.83	91.7	36:03	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.73	86.7	38:46	0.46	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.355	88.6	31:15	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.373	93.3	33:54	1.57	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.353	88.2	36:40	1.42	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.384	96.0	35:57	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.354	88.6	40:42	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:43	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:00	1.25	

Client Information			**Sample Information**		
Project Name:	SWMU 54 RFI		Report Basis:		
			Matrix:	Water	
Sample ID:	EQBK-6		Weight / Volume:	964 mL	
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14080	
Project ID:	G296-350		Instrument:	HRMS1	
Sample ID:	G296-350-10C		Filename:	a05feb07b-7	
Collection Date/Time:	01/12/07	12:20	Retchk:	a05feb07b-1	
Receipt Date/Time:	01/13/07	9:40	Begin ConCal:	a05feb07b-1	
Extraction Date:	01/22/07		End ConCal:	a05feb07b-15	
Analysis Date/Time:	02/05/07	15:38	Initial Cal:	m8290-071006e	

Form Version:[8290_DB_2.08]Report

Analyzed by: JWS
Date: 02-12-07

Reviewed by: CMW
Date: 2/12/07

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: RA
Date: 2/14/07
DV Level: II (III) IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002)
X NFG Region III Draft Guidance (March 1999)

Project Name: SWMU54
Project Number: 11054351
Laboratory: SGS
SDG No.: G296-350
Method No.: 8290

1.0 General: Chain-of-Custody

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times

		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)

		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B". (use 10X for OCDD/OCDF data) TEQ values should not be calculated for isomers flagged B.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	✓		

Notes: MBs displayed pos. detections. <10x for OCDD and <5x for others → B/Z
EQBK-6 also displayed pos for OCDD, 1,2,3,7,8-PeCDF which were prev. flagged B/Z and 2,3,4,7,8-PeCDF

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-"; by greater than 50%, "J+/R-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL > 2.5:1 ; CCC >10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "N+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits	
4	M/M+2	0.77	0.65- 0.89	
5	M+2/M+4	1.55	1.32- 1.78	
6	M+2/M+2	1.24	1.05- 1.43	
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	
~~7~~	~~M+2/M+4~~	~~1.04~~	~~0.88- 1.20~~	N/A for APPIX
~~8~~	~~M+2~~	~~0.89~~	~~0.76- 1.02~~	N/A for APPIX

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓		

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed at the same frequency as calibrations that defines descriptor switching times of scan ranges? If not, make a note in DV Report.	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≤ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	✓		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	✓		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?	✓		
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?	✓		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

The MS for 545B82B %R>125 for OCDD at 134%. and RPD 720%. at 21.4%.

Parent POS → J, UJ

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards

		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	✓		
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		
8.3	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	✓		

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.	✓		
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

	545B82C	DUP-7	RPD		545B82C	DUP-7	RPD
1,2,3,7,8-PeCDD	0.0931	0.0789	16.5%	2,3,4,6,7,8-HxCDF	~~0.083~~ ND	~~ND~~ 0.0853	OKV
1,2,3,4,7,8-HxCDD	0.109	0.0749	37.1%	1,2,3,7,8,9-HxCDF	~~0.055~~ ND	~~ND~~ 0.0855	OKV
1,2,3,6,7,8-HxCDD	0.154	0.127 ~~0.506~~	19%	1,2,3,4,6,7,8-HpCDF	0.218	0.233	7% ✓
1,2,3,7,8,9-HxCDD	~~0.568~~ 0.268	0.229	15%	OCDF	0.375	ND	OK ✓
1,2,3,4,6,7,8-HpCDD	5.87	5.49	6.7%				
OCDD	364	405	11%				

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓		
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.	✓		
10.4	Is the signal to noise ≥ 2.5 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥ 2.5 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Are the two identification peak apexs within 2 seconds for positive identifications? If not, result is reported as non-detect, U(+).	✓		
10.7	Are polychlorinated diphenyl ether (PCDPE) interferences in the PCDPE channel with a S/N ratio > 2.5 and with a RT within ± 2 seconds? If yes, qualify positive furan results I.	✓		
10.8	Was a second column confirmation used for positive 2,3,7,8-TCDF?	✓		
	If no, apply "R" to the positive 2,3,7,8-TCDF results.			
	If yes, calculate the %D between the two column results, report the lower of the two values if the %D is > 25% and qualify J.			
10.9	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.10	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes:

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
11.1	Are Isotopic ratios for a detected analyte within the following established control limits...?	✓		

# Cl ion atoms	Ion Type	Theoretical	Control Limits	RIII Expanded Limits
4	M/M+2	0.77	0.65- 0.89	0.58- 0.96
5	M+2/M+4	1.55	1.32- 1.78	1.16- 1.94
6	M+2/M+2	1.24	1.05- 1.43	0.93- 1.55
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	0.38- 0.64
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	0.33- 0.55
7	M+2/M+4	1.04	0.88- 1.2	0.78- 1.30
8	M+2	0.89	0.76- 1.02	0.67- 1.11

	For positive field sample results with ion abundance ratios outside the method control limits but within the expanded RIII limits, The laboratory should report the concentration as an estimated maximum possible concentration (EMPC). Region III requires this type of result to be reported as true PCDD/PCDF isomer. The validator shall also qualify J.			
	For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.			
	For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).			
11.2	RIII separates 2,3,7,8-chlorinated isomers from total isomers for each congener group and reports results as 2,3,7,8-chlorine substituted and 'Other Total' PCDD/PCDF isomers. If laboratory did not report these separate, make a note in the DV report.	✓		

Notes: EMPCs were reported by the lab:
According to Region III, whose ion ratios >25% → ~~NJ~~ Changed to NDs
" " " <25% → outside Method QC but within expanded → J, W

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:_____			
12.1.2	Number of target compounds in each analysis:_____			
12.1.3	Number of results rejected and not reported:_____			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100			

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	ND	0.000920					
1,2,3,7,8-PeCDD	0.00102			34.05	1.44		A
1,2,3,4,7,8-HxCDD	ND	0.00250					
1,2,3,6,7,8-HxCDD	ND	0.00250					
1,2,3,7,8,9-HxCDD	ND	0.00250					
1,2,3,4,6,7,8-HpCDD	0.00370			39.96	1.11		A
OCDD	0.0480			44.08	0.97		A
2,3,7,8-TCDF	ND	0.000904					
1,2,3,7,8-PeCDF	0.000940			33.22	1.37		A
2,3,4,7,8-PeCDF	EMPC	0.00250	0.000980	33.85	1.31	*	A
1,2,3,4,7,8-HxCDF	EMPC	0.00250	0.000980	35.90	0.89	*	A
1,2,3,6,7,8-HxCDF	0.00120			35.99	1.36		A
2,3,4,6,7,8-HxCDF	EMPC	0.00250	0.000720	36.49	1.04	*	A
1,2,3,7,8,9-HxCDF	ND	0.00250					
1,2,3,4,6,7,8-HpCDF	EMPC	0.00250	0.00178	38.72	1.36	*	A
1,2,3,4,7,8,9-HpCDF	EMPC	0.00250	0.000720	40.61	0.86	*	A
OCDF	EMPC	0.00500	0.00472	44.38	1.08	*	A
Total TCDDs	ND	0.000920					
Total PeCDDs	0.00102						
Total HxCDDs	ND	0.00250					
Total HpCDDs	0.00370						
Total TCDFs	ND	0.000904					
Total PeCDFs	0.000940		0.00192				
Total HxCDFs	0.00120		0.00290				
Total HpCDFs	ND	0.00250	0.00250				
WHO-2005 TEQ (ND=0)	0.00122		0.00171				
WHO-2005 TEQ (ND=½)	0.00288		0.00272				

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Water	
Sample ID:	Lab Method Blank		Weight / Volume:	1000 mL	
			Solids / Lipids:	NA	%
			Original pH :	5	
Laboratory Information			Batch ID:	WG14080	
Project ID:			Instrument:	HRMS3	
Sample ID:			Filename:	c26jan07d_4-3	
Collection Date/Time:			Retchk:	c26jan07d_3-14	
Receipt Date/Time:			Begin ConCal:	c26jan07d_3-14	
Extraction Date:	01/22/07		End ConCal:	c26jan07d_4-14	
Analysis Date/Time:	01/28/07	3:07	Initial Cal:	m8290-c110206a	

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.102				
1,2,3,7,8-PeCDD	ND	0.500				
1,2,3,4,7,8-HxCDD	ND	0.500				
1,2,3,6,7,8-HxCDD	ND	0.500				
1,2,3,7,8,9-HxCDD	ND	0.500				
1,2,3,4,6,7,8-HpCDD	0.384 X5	=1.92		40:07	0.98	A
OCDD	2.89 X10	=28.9		44:22	0.88	A
2,3,7,8-TCDF	0.358 X5	=1.79		30:40	0.78	A
1,2,3,7,8-PeCDF	0.110 X5	=0.55		33:21	1.76	A
2,3,4,7,8-PeCDF	0.102 X 5	=0.51		33:58	1.70	A
1,2,3,4,7,8-HxCDF	ND	0.500				
1,2,3,6,7,8-HxCDF	ND	0.500				
2,3,4,6,7,8-HxCDF	ND	0.500				
1,2,3,7,8,9-HxCDF	ND	0.500				
1,2,3,4,6,7,8-HpCDF	ND	0.500				
1,2,3,4,7,8,9-HpCDF	ND	0.500				
OCDF	ND	1.00				
Total TCDDs	ND	0.102				
Total PeCDDs	ND	0.500				
Total HxCDDs	ND	0.500				
Total HpCDDs	0.384		0.706			
Total TCDFs	0.564					
Total PeCDFs	0.212					
Total HxCDFs	ND	0.500				
Total HpCDFs	ND	0.500				
WHO-2005 TEQ (ND=0)	0.0744		0.0744			
WHO-2005 TEQ (ND=½)	0.556		0.556			

Client Information			**Sample Information**	
Project Name:			Report Basis:	
			Matrix:	Soil
Sample ID:	Lab Method Blank		Weight / Volume:	10 g
			Solids / Lipids:	NA %
			Original pH :	NA
Laboratory Information			Batch ID:	WG14092
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a31jan07a-4
Collection Date/Time:			Retchk:	a31jan07a-1
Receipt Date/Time:			Begin ConCal:	a31jan07a-1
Extraction Date:	01/29/07		End ConCal:	a31jan07a-6
Analysis Date/Time:	01/31/07	11:08	Initial Cal:	m8290-071006e

Method 8290
Lab Method Blank

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.64	82.0	31:19	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.70	85.2	34:09	1.57	Q
13C12-1,2,3,6,7,8-HxCDD	2.0	1.77	88.5	36:49	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.51	75.5	40:07	1.06	
13C12-OCDD	4.0	2.56	64.1	44:21	0.90	
13C12-2,3,7,8-TCDF	2.0	2.01	100	30:39	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.68	84.1	33:21	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.90	95.2	36:07	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.67	83.4	38:52	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.355	88.9	31:19	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.342	85.5	33:57	1.55	Q
13C12-1,2,3,4,7,8-HxCDD	0.4	0.367	91.7	36:45	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.407	102	36:01	0.55	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.315	78.7	40:48	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	30:49	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	37:04	1.24	

Client Information			**Sample Information**		
Project Name:			Report Basis:		
			Matrix:	Soil	
Sample ID:	Lab Method Blank		Weight / Volume:	10 g	
			Solids / Lipids:	NA	%
			Original pH :	NA	
Laboratory Information			Batch ID:	WG14092	
Project ID:			Instrument:	HRMS1	
Sample ID:			Filename:	a31jan07a-4	
Collection Date/Time:			Retchk:	a31jan07a-1	
Receipt Date/Time:			Begin ConCal:	a31jan07a-1	
Extraction Date:	01/29/07		End ConCal:	a31jan07a-6	
Analysis Date/Time:	01/31/07	11:08	Initial Cal:	m8290-071006e	

Form Version:[8290_DB_2.08]Report

Analyzed by: JWP
Date: 01.31.07

Reviewed by: CAL
Date: 1/31/07

Method 8290

Results for MS/MSD

54SB82B

Analyte	Sample pg/g	Spike pg	MS pg/g	%REC (75-125)		MSD pg/g	%REC (75-125)	%RPD (20)	
2,3,7,8-TCDD	ND	200	21.3	100		22.4	103	2.46	
1,2,3,7,8-PeCDD	0.0683	1000	99.3	93.3		104	95.3	2.05	
1,2,3,4,7,8-HxCDD	0.0778	1000	106	99.6		108	98.9	0.705	
1,2,3,6,7,8-HxCDD	0.123	1000	111	104		117	107	2.69	
1,2,3,7,8,9-HxCDD	0.184	1000	102	95.8		112	102	6.79	
1,2,3,4,6,7,8-HpCDD	4.00	1000	109	98.7		111	98.1	0.688	
OCDD	251	2000	536	134	#	487	108	21.4	#
2,3,7,8-TCDF	0.414	200	18.3	84.1		19.7	88.4	4.96	
1,2,3,7,8-PeCDF	0.0759	1000	109	102		113	104	1.03	
2,3,4,7,8-PeCDF	0.144	1000	112	105		111	102	3.47	
1,2,3,4,7,8-HxCDF	0.0531	1000	104	97.8		106	97.1	0.669	
1,2,3,6,7,8-HxCDF	0.0436	1000	109	102		112	103	0.141	
2,3,4,6,7,8-HxCDF	0.116	1000	104	97.7		107	98.0	0.272	
1,2,3,7,8,9-HxCDF	0.0626	1000	95.4	89.7		101	92.5	3.13	
1,2,3,4,6,7,8-HpCDF	0.275	1000	107	100		110	101	0.197	
1,2,3,4,7,8,9-HpCDF	ND	1000	96.6	90.8		103	94.4	3.84	
OCDF	ND	2000	214	101		212	97.2	3.51	

Client Information

		Solids:	79.7	%
Project ID:	SWMU 54 RFI	Sample amount:	13.2	g
Sample ID:	54SB82B	MS amount:	11.8	g
		MSD amount:	11.5	g

Laboratory Information

Project ID:	G296-350
Sample ID:	G296-350-5B
MS ID:	G296-350-6B
MSD ID:	G296-350-7B

Reviewed By: _____

SGS

Case Narrative
SGS Project: **G296-350**
Project Name: **SWMU 54 RFI**

For Methods: 8290

- The submitted samples were accepted into the lab on January 12th, 2007 and extracted on January 22nd and January 29th, 2007 by methods 3540C and 3520C. The sample extracts and associated QC extracts were then processed through clean-up by method 3630/3620 and analyzed by HRGC/HRMS for method 8290.

Craig R. Tronzo 2/12/07

Craig R. Tronzo Date
Data Validation/QA Officer

Secondary Review

W. Mike Larkins Date
Technical Director

Or

Heather Patterson 12Feb07

Heather Patterson Date
Director

SGS

List of Qualifiers

B	Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.
EDL	"Estimated Detection Limit"
EMPC	"Estimated Maximum Possible Concentration"
ppt	Parts-per-trillion (pg/g; ng/L)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.
#	Outside quality control limits
*	See case narrative

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A	Amount detected is less than the Lower Calibration Limit.
J	Amount detected is between the Method Detection Limit and the Lower Calibration Limit.
E	Amount detected is greater than the Upper Calibration Limit.
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).
Q	Indicates the presence of a quantitative interference. This situation generally results in an underestimation of the affected analyte(s).
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).
DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

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(1)

CLIENT: URS

CONTACT: Rosharak Aryan PHONE NO:(804) 965-9000

PROJECT: 11656531 SITE/PWSID#: SWMU 54 RFI

REPORTS TO: E-MAIL: rosharak_aryan@urscorp.com

Rosharak Aryan FAX NO.:(804) 965-9764

INVOICE TO: client QUOTE #

P.O. NUMBER

SGS Reference: G296-350

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP G=GRAB)	Preservatives Used	Analysis Required (3) SW8290 Dioxins/furans	REMARKS
	54SB23A ✓	1-12-07	9:18	SO	1	G		✓	
	54SB23B ✓		9:23	SO	1	G		✓	
	54SB23C ✓		9:28	SO	1	G		✓	
	54SB82A ✓		10:05	SO	1	G		✓	
	54SB82B ✓✓		10:10	SO	1	G		✓	
	54SB82C ✓		10:15	SO	1	G		✓	
	DUP 7 ✓		10:15	SO	1	G		✓	
	54SB82B MS/MSD	✓✓	10:10	SO	1	G		✓	
	EQBK-6 ✓	✓	12:20	W	2	G		✓	

(5)

Collected/Relinquished By:(1)	Date	Time	Received By:
	1/12/07	13:52	
Relinquished By: (2)	Date	Time	Received By:
	1/13/07	9:40	
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

Shipping Carrier: FedEx 1563 5619

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature ∫C: 3.8

Special Deliverable Requirements:

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions:

200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301

5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

Sample Receipt Checklist (SRC)

SGS Environmetal Services Inc.

Client: **URS** Lab Proj. ID: **G296-350**

Client Proj. ID: **11656531**

1. X Shipped — Notes:
   __ Hand Delivered

2. __ Proper, full, and complete documentation — Notes:
   (unique sample identification on durable label with indelible ink, location of collection, date/time of collection, collector's name, preservation type, sample type (method/matrix))
   X Acceptable documentation (but, incomplete)
   __ Unacceptable documentation

3. X Custody Tape on Container — Notes:
   __ No Custody Tape

4. X Samples Intact* — Notes:
   (are in appropriate container, are not damaged, and do not show signs of contamination)
   __ Samples Broken / Leaking
   __ VOA Vials Checked for Air Bubbles

5. X Chilled on Receipt* Actual Temp.(s) in °C: 3.8
   __ Ambient on Receipt — Notes:
   __ Walk-in on Ice; Coming down to temp.
   __ Received out of temperature protocol

6. X Sufficient Sample Submitted — Notes:
   __ Insufficient Sample Submitted

7. X Samples Preserved Correctly* — Notes:
   (see preservative checklist where applicable)
   __ Improper Preservative(s)
   __ None recommended (N/A)

8. X Received Within Holding Time — Notes:
   __ Not Received Within Holding Time
   __ N/A

9. X No Discrepancies Noted — Notes:
   __ Discrepancies Noted

Comments:

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

Inspected and Logged in by:

DC27.091503.3 Date / Time: Mon-1/15/07 10:15

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-389 **Fraction:** Dioxin/Furans

Lab: Paradigm Analytical **Project Name** Radford SWMU 54

Reviewer: RA **Date:** July 2, 2007

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The method blank displayed positive detections for 1,2,3,4,7,8-HxCDF at 0.00332 ng/L, 1,2,3,4,6,7,8-HpCDF at 0.0130 ng/L, and OCDF at 0.0262 ng/L. The positive associated equipment blank result less than ten times the method blank concentration for OCDF and less than five times the method blank concentrations for the other compounds were flagged "B,z". The equipment blank, Eq Blank also displayed positive detections for several compounds. The associated field sample results were non-detects, and no further data qualifying action was necessary.

The equipment blank displayed detections reported by the laboratory as estimated maximum possible concentrations (EMPCs). In both cases the EMPC displayed an ion abundance ratio within the EPA Region III criterion of +/- 25%, and was qualified as "J,w".

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Reyam

SGS Environmental Services, Inc.

Cust Proj ID: SWMU54 11656351
Client Name: URS

G296-389

Due Date: 2007-06-28 17:00:00
Login Date: 2007-06-12 11:51:04

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	Report	Analysis	Status
G296-389-1	A	Eq Blank	RUSH	2007-06-05 11:20:00	2007-06-12	2007-06-28	Water	W2	Full	8290	AL::NEED
G296-389-2	A	54MW-6	RUSH	2007-06-05 10:55:00	2007-06-07	2007-06-28	Water	W2	Full	8290	RG::NEED
						2007-06-28	Water	W2	Full	Solids	AL::NEED
	B					2007-06-28	Water	W2	Full	8290	RG::NEED
						2007-06-28	Water	W2	Full	Solids	AL::NEED
G296-389-3	A	54MW-4	RUSH	2007-06-05 12:18:00	2007-06-07	2007-06-28	Water	W2	Full	8290	RG::NEED
						2007-06-28	Water	W2	Full	Solids	AL::NEED
	B					2007-06-28	Water	W2	Full	8290	RG::NEED
						2007-06-28	Water	W2	Full	Solids	AL::NEED
G296-389-4	A	54MW-7	RUSH	2007-06-05 12:37:00	2007-06-07	2007-06-28	Water	W2	Full	8290	RG::NEED
						2007-06-28	Water	W2	Full	Solids	AL::NEED
	B					2007-06-28	Water	W2	Full	8290	RG::NEED
						2007-06-28	Water	W2	Full	Solids	AL::NEED
G296-389-5	A	DUP-1	RUSH	2007-06-05 00:00:00	2007-06-07	2007-06-28	Water	W2	Full	8290	RG::NEED
						2007-06-28	Water	W2	Full	Solids	AL::NEED
	B					2007-06-28	Water	W2	Full	8290	RG::NEED
						2007-06-28	Water	W2	Full	Solids	AL::NEED

Method 8290
Eq Blank
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio		Qualifier
2,3,7,8-TCDD	0.00904			30:13	0.87		A
1,2,3,7,8-PeCDD	0.0177			33:31	1.58		A
1,2,3,4,7,8-HxCDD	EMPC	0.00610	0.0108 J,W	36:00	1.05	*	A
1,2,3,6,7,8-HxCDD	0.00902			36:04	1.10		A
1,2,3,7,8,9-HxCDD	0.0110			36:18	1.35		A
1,2,3,4,6,7,8-HpCDD	0.00761			39:09	1.02		A
OCDD	ND	0.0220					
2,3,7,8-TCDF	0.00524			29:16	0.79		A
1,2,3,7,8-PeCDF	0.0236			32:45	1.73		A
2,3,4,7,8-PeCDF	0.0178			33:21	1.62		A
1,2,3,4,7,8-HxCDF	0.0146 B,J	Z		35:19	1.16		A
1,2,3,6,7,8-HxCDF	0.0164			35:25	1.35		A
2,3,4,6,7,8-HxCDF	EMPC	0.00478	0.0110 J,W	35:52	1.47	*	A
1,2,3,7,8,9-HxCDF	0.0134			36:36	1.11		A
1,2,3,4,6,7,8-HpCDF	0.00966 B,J	Z		38:00	1.15		A
1,2,3,4,7,8,9-HpCDF	0.00843			39:46	1.13		A
OCDF	0.0122 B,J	Z		43:19	1.00		A
Total TCDDs	0.00904						
Total PeCDDs	0.0177						
Total HxCDDs	0.0200		0.0308				
Total HpCDDs	0.00761						
Total TCDFs	0.00524						
Total PeCDFs	0.0415						
Total HxCDFs	0.0444		0.0554				
Total HpCDFs	0.0181						
WHO-2005 TEQ (ND=0)	0.0400		0.0422				
WHO-2005 TEQ (ND=½)	0.0406		0.0422				

Client Information			**Sample Information**		
Project Name:	SWMU54 GW-Q3				
			Matrix:	Water	
Sample ID:	Eq Blank		Weight / Volume:	1046 mL	
			Solids / Lipids:	NA	%
			Original pH :	5	
Laboratory Information			Batch ID:	WG14314	
Project ID:	G296-389		Instrument:	HRMS1	
Sample ID:	G296-389-1B		Filename:	a18jun07b_7-5	
Collection Date/Time:	06/05/07	11:20	Retchk:	a18jun07b_6-14	
Receipt Date/Time:	06/12/07	10:15	Begin ConCal:	a18jun07b_6-14	
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14	
Analysis Date/Time:	06/21/07	15:28	Initial Cal:	m8290-071006e	

Method 8290
Eq Blank
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.31	65.5	30:10	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.31	65.5	33:31	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.56	78.1	36:04	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.30	65.0	39:09	1.04	
13C12-OCDD	4.0	2.02	50.6	43:04	0.88	
13C12-2,3,7,8-TCDF	2.0	1.58	79.2	29:16	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.28	64.2	32:45	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.52	76.1	35:25	0.51	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.35	67.7	37:58	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.294	73.4	30:13	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.293	73.1	33:21	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.254	63.5	35:58	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.282	70.4	35:19	0.57	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.280	70.1	39:46	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:25	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:18	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU54 GW-Q3			
			Matrix:	Water
Sample ID:	Eq Blank		Weight / Volume:	1046 mL
			Solids / Lipids:	NA %
			Original pH :	5
Laboratory Information			Batch ID:	WG14314
Project ID:	G296-389		Instrument:	HRMS1
Sample ID:	G296-389-1B		Filename:	a18jun07b_7-5
Collection Date/Time:	06/05/07	11:20	Retchk:	a18jun07b_6-14
Receipt Date/Time:	06/12/07	10:15	Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	15:28	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.14]Report

Analyzed by: JWP
Date: 06-22-07

Reviewed by: [signature]
Date: 12/27/07

Method 8290
54MW-6
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00816				
1,2,3,7,8-PeCDD	ND	0.00506				
1,2,3,4,7,8-HxCDD	ND	0.00506				
1,2,3,6,7,8-HxCDD	ND	0.00524				
1,2,3,7,8,9-HxCDD	ND	0.00511				
1,2,3,4,6,7,8-HpCDD	ND	0.0114				
OCDD	ND	0.0174				
2,3,7,8-TCDF	ND	0.00429				
1,2,3,7,8-PeCDF	ND	0.00506				
2,3,4,7,8-PeCDF	ND	0.00506				
1,2,3,4,7,8-HxCDF	ND	0.00506				
1,2,3,6,7,8-HxCDF	ND	0.00506				
2,3,4,6,7,8-HxCDF	ND	0.00506				
1,2,3,7,8,9-HxCDF	ND	0.00506				
1,2,3,4,6,7,8-HpCDF	ND	0.00539				
1,2,3,4,7,8,9-HpCDF	ND	0.00670				
OCDF	ND	0.0185				
Total TCDDs	ND	0.00816				
Total PeCDDs	ND	0.00506				
Total HxCDDs	ND	0.00524				
Total HpCDDs	ND	0.0114				
Total TCDFs	ND	0.00429				
Total PeCDFs	ND	0.00506				
Total HxCDFs	ND	0.00506				
Total HpCDFs	ND	0.00670				
WHO-2005 TEQ (ND=0)	ND		ND			
WHO-2005 TEQ (ND=½)	0.00956		0.00956			

Client Information			**Sample Information**	
Project Name:	SWMU54 GW-Q3			
			Matrix:	Water
Sample ID:	54MW-6		Weight / Volume:	989 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14314
Project ID:	G296-389		Instrument:	HRMS1
Sample ID:	G296-389-2C		Filename:	a18jun07b_7-6
Collection Date/Time:	06/05/07	10:55	Retchk:	a18jun07b_6-14
Receipt Date/Time:	06/07/07	10:30	Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	16:16	Initial Cal:	m8290-071006e

Method 8290
54MW-6
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.27	63.6	30:10	0.77	
13C12-1,2,3,7,8-PeCDD	2.0	1.31	65.3	33:31	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.61	80.7	36:04	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.37	68.3	39:09	1.06	
13C12-OCDD	4.0	2.24	55.9	43:04	0.90	
13C12-2,3,7,8-TCDF	2.0	1.60	79.8	29:15	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.30	64.8	32:45	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.54	77.1	35:24	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.39	69.5	37:58	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.296	74.0	30:13	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.302	75.5	33:21	1.60	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.272	67.9	35:58	1.23	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.319	79.7	35:19	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.300	75.0	39:46	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:25	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:18	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU54 GW-Q3			
			Matrix:	Water
Sample ID:	54MW-6		Weight / Volume:	989 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14314
Project ID:	G296-389		Instrument:	HRMS1
Sample ID:	G296-389-2C		Filename:	a18jun07b_7-6
Collection Date/Time:	06/05/07	10:55	Retchk:	a18jun07b_6-14
Receipt Date/Time:	06/07/07	10:30	Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	16:16	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 06-22-07

Reviewed by: _____
Date: 6/22/07

Method 8290
54MW-4
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00781				
1,2,3,7,8-PeCDD	ND	0.00510				
1,2,3,4,7,8-HxCDD	ND	0.00510				
1,2,3,6,7,8-HxCDD	ND	0.00526				
1,2,3,7,8,9-HxCDD	ND	0.00513				
1,2,3,4,6,7,8-HpCDD	ND	0.0100				
OCDD	ND	0.0194				
2,3,7,8-TCDF	ND	0.00465				
1,2,3,7,8-PeCDF	ND	0.00510				
2,3,4,7,8-PeCDF	ND	0.00510				
1,2,3,4,7,8-HxCDF	ND	0.00510				
1,2,3,6,7,8-HxCDF	ND	0.00510				
2,3,4,6,7,8-HxCDF	ND	0.00510				
1,2,3,7,8,9-HxCDF	ND	0.00510				
1,2,3,4,6,7,8-HpCDF	ND	0.00510				
1,2,3,4,7,8,9-HpCDF	ND	0.00633				
OCDF	ND	0.0176				
Total TCDDs	ND	0.00781				
Total PeCDDs	ND	0.00510				
Total HxCDDs	ND	0.00526				
Total HpCDDs	ND	0.0100				
Total TCDFs	ND	0.00465				
Total PeCDFs	ND	0.00510				
Total HxCDFs	ND	0.00510				
Total HpCDFs	ND	0.00633				
WHO-2005 TEQ (ND=0)	ND		ND			
WHO-2005 TEQ (ND=½)	0.00944		0.00944			

Client Information			**Sample Information**	
Project Name:	SWMU54 GW-Q3			
			Matrix:	Water
Sample ID:	54MW-4		Weight / Volume:	981 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14314
Project ID:	G296-389		Instrument:	HRMS1
Sample ID:	G296-389-3C		Filename:	a18jun07b_7-7
Collection Date/Time:	06/05/07	12:18	Retchk:	a18jun07b_6-14
Receipt Date/Time:	06/07/07	10:30	Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	17:03	Initial Cal:	m8290-071006e

Method 8290
54MW-4
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.36	67.8	30:10	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.42	70.8	33:31	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.66	82.8	36:04	1.26	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.46	72.8	39:09	1.05	
13C12-OCDD	4.0	2.39	59.7	43:04	0.89	
13C12-2,3,7,8-TCDF	2.0	1.69	84.3	29:15	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.36	67.9	32:45	1.57	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.64	81.9	35:24	0.52	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.49	74.7	37:58	0.45	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.318	79.6	30:13	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.325	81.2	33:21	1.58	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.279	69.8	35:58	1.24	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.295	73.7	35:19	0.50	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.312	78.1	39:46	0.44	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:25	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:18	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU54 GW-Q3			
			Matrix:	Water
Sample ID:	54MW-4		Weight / Volume:	981 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14314
Project ID:	G296-389		Instrument:	HRMS1
Sample ID:	G296-389-3C		Filename:	a18jun07b_7-7
Collection Date/Time:	06/05/07	12:18	Retchk:	a18jun07b_6-14
Receipt Date/Time:	06/07/07	10:30	Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	17:03	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.14]Report

Analyzed by: JWP
Date: 06.22.07

Reviewed by: [illegible]
Date: 6/22/07

Method 8290
54MW-7
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00926				
1,2,3,7,8-PeCDD	ND	0.00551				
1,2,3,4,7,8-HxCDD	ND	0.00729				
1,2,3,6,7,8-HxCDD	ND	0.00755				
1,2,3,7,8,9-HxCDD	ND	0.00736				
1,2,3,4,6,7,8-HpCDD	ND	0.0103				
OCDD	ND	0.0223				
2,3,7,8-TCDF	ND	0.00527				
1,2,3,7,8-PeCDF	ND	0.00510				
2,3,4,7,8-PeCDF	ND	0.00510				
1,2,3,4,7,8-HxCDF	ND	0.00510				
1,2,3,6,7,8-HxCDF	ND	0.00510				
2,3,4,6,7,8-HxCDF	ND	0.00510				
1,2,3,7,8,9-HxCDF	ND	0.00538				
1,2,3,4,6,7,8-HpCDF	ND	0.00668				
1,2,3,4,7,8,9-HpCDF	ND	0.00832				
OCDF	ND	0.0177				
Total TCDDs	ND	0.00926				
Total PeCDDs	ND	0.00551				
Total HxCDDs	ND	0.00755				
Total HpCDDs	ND	0.0103				
Total TCDFs	ND	0.00527				
Total PeCDFs	ND	0.00510				
Total HxCDFs	ND	0.00538				
Total HpCDFs	ND	0.00832				
WHO-2005 TEQ (ND=0)	ND		ND			
WHO-2005 TEQ (ND=½)	0.0108		0.0108			

Client Information			**Sample Information**	
Project Name:	SWMU54 GW-Q3			
			Matrix:	Water
Sample ID:	54MW-7		Weight / Volume:	980 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14314
Project ID:	G296-389		Instrument:	HRMS1
Sample ID:	G296-389-4C		Filename:	a18jun07b_7-8
Collection Date/Time:	06/05/07	12:37	Retchk:	a18jun07b_6-14
Receipt Date/Time:	06/07/07	10:30	Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	17:50	Initial Cal:	m8290-071006e

Method 8290
54MW-7
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.32	66.2	30:10	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.35	67.7	33:31	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.60	80.0	36:04	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.36	68.1	39:09	1.04	
13C12-OCDD	4.0	2.27	56.8	43:04	0.90	
13C12-2,3,7,8-TCDF	2.0	1.62	80.8	29:15	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.33	66.4	32:45	1.58	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.54	76.9	35:24	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.40	70.2	37:58	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.323	80.7	30:13	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.325	81.2	33:21	1.59	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.288	71.9	35:58	1.28	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.337	84.2	35:19	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.310	77.5	39:46	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:25	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:18	1.25	

Client Information			**Sample Information**	
Project Name:	SWMU54 GW-Q3			
			Matrix:	Water
Sample ID:	54MW-7		Weight / Volume:	980 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14314
Project ID:	G296-389		Instrument:	HRMS1
Sample ID:	G296-389-4C		Filename:	a18jun07b_7-8
Collection Date/Time:	06/05/07	12:37	Retchk:	a18jun07b_6-14
Receipt Date/Time:	06/07/07	10:30	Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	17:50	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.14]Report

Analyzed by: JW
Date: 06.22.07

Reviewed by: [illegible]
Date: 6/22/07

Method 8290
DUP-1
URS

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.00884				
1,2,3,7,8-PeCDD	ND	0.00508				
1,2,3,4,7,8-HxCDD	ND	0.00667				
1,2,3,6,7,8-HxCDD	ND	0.00691				
1,2,3,7,8,9-HxCDD	ND	0.00674				
1,2,3,4,6,7,8-HpCDD	ND	0.0128				
OCDD	ND	0.0176				
2,3,7,8-TCDF	ND	0.00491				
1,2,3,7,8-PeCDF	ND	0.00508				
2,3,4,7,8-PeCDF	ND	0.00508				
1,2,3,4,7,8-HxCDF	ND	0.00508				
1,2,3,6,7,8-HxCDF	ND	0.00508				
2,3,4,6,7,8-HxCDF	ND	0.00508				
1,2,3,7,8,9-HxCDF	ND	0.00508				
1,2,3,4,6,7,8-HpCDF	ND	0.00619				
1,2,3,4,7,8,9-HpCDF	ND	0.00770				
OCDF	ND	0.0175				
Total TCDDs	ND	0.00884				
Total PeCDDs	ND	0.00508				
Total HxCDDs	ND	0.00691				
Total HpCDDs	ND	0.0128				
Total TCDFs	ND	0.00491				
Total PeCDFs	ND	0.00508				
Total HxCDFs	ND	0.00508				
Total HpCDFs	ND	0.00770				
WHO-2005 TEQ (ND=0)	ND		ND			
WHO-2005 TEQ (ND=½)	0.0102		0.0102			

Client Information			**Sample Information**	
Project Name:	SWMU54 GW-Q3			
			Matrix:	Water
Sample ID:	DUP-1		Weight / Volume:	984 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14314
Project ID:	G296-389		Instrument:	HRMS1
Sample ID:	G296-389-5C		Filename:	a18jun07b_7-9
Collection Date/Time:	06/05/07		Retchk:	a18jun07b_6-14
Receipt Date/Time:	06/07/07	10:30	Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	18:38	Initial Cal:	m8290-071006e

Method 8290
DUP-1
URS

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.27	63.3	30:10	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.30	65.0	33:31	1.59	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.54	77.1	36:04	1.25	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.31	65.4	39:09	1.05	
13C12-OCDD	4.0	2.30	57.4	43:04	0.89	
13C12-2,3,7,8-TCDF	2.0	1.54	77.1	29:15	0.78	
13C12-1,2,3,7,8-PeCDF	2.0	1.28	64.1	32:45	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.48	74.0	35:24	0.53	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.34	67.0	37:58	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.325	81.3	30:13	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.332	83.0	33:21	1.61	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.289	72.2	35:58	1.25	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.340	84.9	35:19	0.51	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.311	77.9	39:46	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:25	0.79	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:18	1.24	

Client Information			**Sample Information**	
Project Name:	SWMU54 GW-Q3			
			Matrix:	Water
Sample ID:	DUP-1		Weight / Volume:	984 mL
			Solids / Lipids:	NA %
			Original pH :	8
Laboratory Information			Batch ID:	WG14314
Project ID:	G296-389		Instrument:	HRMS1
Sample ID:	G296-389-5C		Filename:	a18jun07b_7-9
Collection Date/Time:	06/05/07		Retchk:	a18jun07b_6-14
Receipt Date/Time:	06/07/07	10:30	Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	18:38	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 06-22-07

Reviewed by: _____
Date: 6/22/07

DATA VALIDATION WORKSHEET
Dioxins and Furans Analysis

Reviewer: RA
Date: 7/23/07
DV Level: II (III) IV
Review Document:
X SW-846 X Project QAPP/SAP X NFG EPA 540-R-02-003 (August 2002) X NFG Region III Draft Guidance (March 1999)

Project Name: SWMU54
Project Number: [redacted]1165435
Laboratory: SGS
SDG No.: G296-359
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	✓		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	✓		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		✓	

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	✓		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		✓	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		✓	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	✓		
3.2	Do any blanks have positive results? If yes, an action level of 5 times the blank value is used to qualify sample results "B". (use 10X for OCDD/OCDF data) TEQ values should not be calculated for isomers flagged B.	✓		
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	✓		

Notes: MB several positive hits, see attached 25X for HxCDF, HpCDF and <10X for OCDF B/Z in EB.

EB also several positive hits. All samples were NDs, no more action.

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	✓		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-"; by greater than 50%, "J+/R-".	✓		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	✓		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL ≥ 2.5:1 ; CCC ≥10:1 ; Internal (IS) and Recovery Standards (RS) in any >10:1) If no: for target analytes, R(-); for ISs or RSs, qualify using professional judgement.			
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "N+/R-".	✓		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits	
4	M/M+2	0.77	0.65- 0.89	
5	M+2/M+4	1.55	1.32- 1.78	
6	M+2/M+2	1.24	1.05- 1.43	
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	
~~7~~	~~M+2/M+4~~	~~1.04~~	~~0.88- 1.20~~	N/A for APPIX
~~8~~	~~M+2~~	~~0.89~~	~~0.76- 1.02~~	N/A for APPIX

4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	✓		

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	✓		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	✓		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	✓		
5.2	Was a window defining mix analyzed at the same frequency as calibrations that defines descriptor switching times of scan ranges? If not, make a note in DV Report.	✓		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≤ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	✓		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?			
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits (in-house generated)?			
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS/MSD results in conjunction with other QC to determine sample data usability.			

Notes:

OPR/OPRD was analyzed ✓

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS recovery form present?	✓		
7.2	Was an LCS analyzed for each batch?	✓		
7.3	Are there any percent recoveries outside the QC limits (in-house generated limits)?		✓	
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards

		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	✓		
8.2	Is the signal to noise ≥ 10 for each internal standard? If no, J(+)/UJ(-) all associated results.	✓		
8.3	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	✓		

Notes:

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	✓		
9.2	Are all analyte duplicate results within control limits? For sample results > 5 x RL, a control limit of 50% RPD will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.	✓		
	Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.			

Notes:

54MW-4 and DUP-1

Both NDs ✓

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range? If no, apply J to these results.	✓		
10.2	Are absolute RTs within -1 to +3 seconds of the RT of the corresponding labelled standard? If no, R(+).	✓		
10.3	Are RRT units less than 0.005 from the CCV when labelled standards are not present? If no, report concentration with totals.			✓
10.4	Is the signal to noise ≥ 2.5 for the quantitation ion of any positive result? If no, UJ(+).	✓		
10.5	Is the signal to noise ≥ 2.5 for the qualitative ion of any positive result? If no, flag J(+).	✓		
10.6	Are the two identification peak apexs within 2 seconds for positive identifications? If not, result is reported as non-detect,	✓		
10.7	Are polychlorinated diphenyl ether (PCDPE) interferences in the PCDPE channel with a S/N ratio > 2.5 and with a RT within ± 2 seconds? If yes, qualify positive furan results I.		✓	
10.8	Was a second column confirmation used for positive 2,3,7,8-TCDF?	✓		
	If no, apply "R" to the positive 2,3,7,8-TCDF results.			
	If yes, calculate the %D between the two column results, report the lower of the two values if the %D is > 25% and qualify J.			
10.9	Do results reflect corrections made for initial volume, dilution factor, and percent solids? If no, correct concentrations.	✓		
10.10	Were any results reported from a dilution? If yes, verify or suggest the best result for use and make note in DV Report.		✓	

Notes:

11.0 Ion abundance criteria and EMPC

		Yes	No	NA
11.1	Are Isotopic ratios for a detected analyte within the following established control limits...?	✓		

# Cl ion atoms	Ion Type	Theoretical	Control Limits	RIII Expanded Limits
4	M/M+2	0.77	0.65- 0.89	0.58- 0.96
5	M+2/M+4	1.55	1.32- 1.78	1.16- 1.94
6	M+2/M+2	1.24	1.05- 1.43	0.93- 1.55
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59	0.38- 0.64
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51	0.33- 0.55
7	M+2/M+4	1.04	0.88- 1.2	0.78- 1.30
8	M+2	0.89	0.76- 1.02	0.67- 1.11

	For positive field sample results with ion abundance ratios outside the method control limits but within the expanded RIII limits, The laboratory should report the concentration as an estimated maximum possible concentration (EMPC). Region III requires this type of result to be reported as true PCDD/PCDF isomer. The validator shall also qualify J.			
	For positive results with ion abundance ratios greater than RIII expanded limits, confirm the value is reported as EMPC by the laboratory. This type of detection is verified and the presence is noted in the DV report. EMPC's with ion ratios greater than 25% from the theoretical ratio are not to be reported by RIII. Values reported as EMPC are not to be included in the total TEQ determination. The validator shall line out or subtract an EMPC with these characteristics.			
	For internal standard with ion abundance ratios outside the method control limits, apply N(+)/R(-).			
11.2	RIII separates 2,3,7,8-chlorinated isomers from total isomers for each congener group and reports results as 2,3,7,8-chlorine substituted and 'Other Total' PCDD/PCDF isomers. If laboratory did not report these separate, make a note in the DV report.	✓		

Notes: EB displayed 2 EMPCs.
1,2,3,4,7,8-H_xCDD true ion abundance ratio within both method criterion of +/- 15% and EPA RIII criterion of +/- 25%. ⇒ J (W).

2,3,4,6,7,8-H_xCDF ratio outside 15% but within EPA RIII 25%
⇒ J (W)

12.0 Data Completeness

		Yes	No	NA
12.1	Is the percent completeness within the control limits? (Control limit 90%)	✓		
12.1.1	Number of samples:			
12.1.2	Number of target compounds in each analysis:			
12.1.3	Number of results rejected and not reported:			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100%.			

Method 8290
Lab Method Blank

Analytical Data Summary Sheet

Analyte	Amount (ng/L)	EDL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	ND	0.0100				
1,2,3,7,8-PeCDD	ND	0.00500				
1,2,3,4,7,8-HxCDD	ND	0.00500				
1,2,3,6,7,8-HxCDD	ND	0.00500				
1,2,3,7,8,9-HxCDD	ND	0.00500				
1,2,3,4,6,7,8-HpCDD	ND	0.00707				
OCDD	ND	0.0164				
2,3,7,8-TCDF	ND	0.00510				
1,2,3,7,8-PeCDF	ND	0.00500				
2,3,4,7,8-PeCDF	ND	0.00500				
1,2,3,4,7,8-HxCDF	0.00332			35:19	1.23	A
1,2,3,6,7,8-HxCDF	ND	0.00500				
2,3,4,6,7,8-HxCDF	ND	0.00500				
1,2,3,7,8,9-HxCDF	ND	0.00500				
1,2,3,4,6,7,8-HpCDF	0.0130			38:00	1.02	A
1,2,3,4,7,8,9-HpCDF	ND	0.00500				
OCDF	0.0262			43:21	0.94	A
Total TCDDs	ND	0.0100				
Total PeCDDs	ND	0.00500				
Total HxCDDs	ND	0.00500				
Total HpCDDs	ND	0.00707				
Total TCDFs	ND	0.00510				
Total PeCDFs	ND	0.00500				
Total HxCDFs	0.00332					
Total HpCDFs	0.0130					
WHO-2005 TEQ (ND=0)	0.000470		0.000470			
WHO-2005 TEQ (ND=½)	0.0106		0.0106			

Client Information			**Sample Information**	
Project Name:				
			Matrix:	Water
Sample ID:	Lab Method Blank		Weight / Volume:	1000 mL
			Solids / Lipids:	NA %
			Original pH :	5
Laboratory Information			Batch ID:	WG14314
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a18jun07b_7-3
Collection Date/Time:			Retchk:	a18jun07b_6-14
Receipt Date/Time:			Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	13:53	Initial Cal:	m8290-071006e

Method 8290
Lab Method Blank

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
13C12-2,3,7,8-TCDD	2.0	1.31	65.6	30:10	0.78	
13C12-1,2,3,7,8-PeCDD	2.0	1.36	68.2	33:31	1.58	
13C12-1,2,3,6,7,8-HxCDD	2.0	1.59	79.7	36:04	1.27	
13C12-1,2,3,4,6,7,8-HpCDD	2.0	1.38	68.9	39:09	1.05	
13C12-OCDD	4.0	2.20	55.0	43:04	0.90	
13C12-2,3,7,8-TCDF	2.0	1.60	79.9	29:15	0.79	
13C12-1,2,3,7,8-PeCDF	2.0	1.35	67.3	32:45	1.59	
13C12-1,2,3,6,7,8-HxCDF	2.0	1.56	77.8	35:24	0.51	
13C12-1,2,3,4,6,7,8-HpCDF	2.0	1.41	70.3	37:58	0.44	
Cleanup Standards						
37Cl4-2,3,7,8-TCDD	0.4	0.279	69.8	30:13	-	
13C12-2,3,4,7,8-PeCDF	0.4	0.284	71.1	33:21	1.62	
13C12-1,2,3,4,7,8-HxCDD	0.4	0.247	61.8	35:58	1.26	
13C12-1,2,3,4,7,8-HxCDF	0.4	0.271	67.8	35:19	0.58	
13C12-1,2,3,4,7,8,9-HpCDF	0.4	0.273	68.3	39:46	0.45	
Injection Standards						
13C12-1,2,3,4-TCDD	2.0	-	-	29:25	0.78	
13C12-1,2,3,7,8,9-HxCDD	2.0	-	-	36:18	1.25	

Client Information			**Sample Information**	
Project Name:				
			Matrix:	Water
Sample ID:	Lab Method Blank		Weight / Volume:	1000 mL
			Solids / Lipids:	NA %
			Original pH :	5
Laboratory Information			Batch ID:	WG14314
Project ID:			Instrument:	HRMS1
Sample ID:			Filename:	a18jun07b_7-3
Collection Date/Time:			Retchk:	a18jun07b_6-14
Receipt Date/Time:			Begin ConCal:	a18jun07b_6-14
Extraction Date:	06/19/07		End ConCal:	a18jun07b_7-14
Analysis Date/Time:	06/21/07	13:53	Initial Cal:	m8290-071006e

Form Version:[8290_DB_2.14]Report

Analyzed by: _____
Date: 06.22.07

Reviewed by: _____
Date: 6/22/07

Analytical Results
for
Ongoing Precision Result (OPR)

Analyte	Spiked (pg/µL)	AMT (pg/µL)	REC %	Range % Lower	Range % Upper	Qualifier
2,3,7,8-TCDD	10	10.8	108	70.0	130	
1,2,3,7,8-PeCDD	50	50.0	99.9	70.0	130	
1,2,3,4,7,8-HxCDD	50	48.1	96.2	70.0	130	
1,2,3,6,7,8-HxCDD	50	57.1	114	70.0	130	
1,2,3,7,8,9-HxCDD	50	51.9	104	70.0	130	
1,2,3,4,6,7,8-HpCDD	50	51.0	102	70.0	130	
OCDD	100	96.8	96.8	70.0	130	
2,3,7,8-TCDF	10	8.84	88.4	70.0	130	
1,2,3,7,8-PeCDF	50	51.5	103	70.0	130	
2,3,4,7,8-PeCDF	50	52.2	104	70.0	130	
1,2,3,4,7,8-HxCDF	50	46.0	92.0	70.0	130	
1,2,3,6,7,8-HxCDF	50	54.1	108	70.0	130	
2,3,4,6,7,8-HxCDF	50	50.4	101	70.0	130	
1,2,3,7,8,9-HxCDF	50	45.6	91.3	70.0	130	
1,2,3,4,6,7,8-HpCDF	50	51.2	102	70.0	130	
1,2,3,4,7,8,9-HpCDF	50	47.6	95.3	70.0	130	
OCDF	100	108	108	70.0	130	

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Project No:	OPR14314
Extraction Date:	19-Jun-07
Analysis Date:	21-Jun-07
Method:	8290

Sample Information

Matrix:	Water

File Information

OPR Filename:	a18jun07b_7-1
Retchk:	a18jun07b_6-14
Begin ConCal:	a18jun07b_6-14
End ConCal:	a18jun07b_7-14
Initial Cal:	m8290-071006e

Analytical Results
for
Ongoing Precision & Recovery Duplicate Results (OPRD)

Analyte	Spiked (pg/µL)	AMT (pg/µL)	Recovery %	#	Range Lower	Range Upper	OPR Rec(%)	#	RPD (±20%)	Qualifier
2,3,7,8-TCDD	10.0	10.7	107		70.0	130	108		0.493	
1,2,3,7,8-PeCDD	50.0	51.0	102		70.0	130	99.9		2.10	
1,2,3,4,7,8-HxCDD	50.0	46.1	92.2		70.0	130	96.2		4.32	
1,2,3,6,7,8-HxCDD	50.0	56.9	114		70.0	130	114		0.118	
1,2,3,7,8,9-HxCDD	50.0	51.2	102		70.0	130	104		1.62	
1,2,3,4,6,7,8-HpCDD	50.0	50.9	102		70.0	130	102		0.267	
OCDD	100	95.8	95.8		70.0	130	96.8		1.08	
2,3,7,8-TCDF	10.0	8.83	88.3		70.0	130	88.4		0.136	
1,2,3,7,8-PeCDF	50.0	52.6	105		70.0	130	103		2.12	
2,3,4,7,8-PeCDF	50.0	52.2	104		70.0	130	104		0.320	
1,2,3,4,7,8-HxCDF	50.0	46.6	93.2		70.0	130	92.0		1.24	
1,2,3,6,7,8-HxCDF	50.0	56.9	114		70.0	130	108		5.09	
2,3,4,6,7,8-HxCDF	50.0	52.3	105		70.0	130	101		3.51	
1,2,3,7,8,9-HxCDF	50.0	46.6	93.3		70.0	130	91.3		2.13	
1,2,3,4,6,7,8-HpCDF	50.0	51.0	102		70.0	130	102		0.0569	
1,2,3,4,7,8,9-HpCDF	50.0	47.6	95.2		70.0	130	95.3		0.0798	
OCDF	100	109	109		70.0	130	108		0.663	

= Outside range limits
* = Ion Ratio Out

QC Information

OPR Project No:	OPRD14314
Extraction Date:	19-Jun-07
Analysis Date:	21-Jun-07
Method:	8290

Sample Information

Matrix:	Water

File Information

OPRD Filename :	a18jun07b_7-2
Retchk:	a18jun07b_6-14
Begin ConCal:	a18jun07b_6-14
End ConCal:	a18jun07b_7-14
Initial Cal:	m8290-071006e

SGS

Case Narrative
SGS Project: **G296-389**
Project Name: **SWMU54 GW-Q3**

For Method: 8290

- The submitted samples were accepted into the lab on June 12th, 2007 and extracted on June 19th, 2007 by method 3520C. The sample extracts and associated QC extracts were then processed through clean-up by method 3630/3620 and analyzed by HRGC/HRMS for Method 8290.

Craig R. Tronzo 6/25/07
Craig R. Tronzo Date
Data Validation/QA Officer

Secondary Review

W. Mike Larkins Date
Technical Director

Or Heather Patterson 25 Jun 07
Heather Patterson Date
Director

SGS

List of Qualifiers: Dioxin's

B Analyte was detected in the Lab Method Blank at a level above the Reporting Limit.

EDL "Estimated Detection Limit"

EMPC "Estimated Maximum Possible Concentration"

ppt Parts-per-trillion (pg/g; ng/L)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

Outside quality control limits

* Indicates that the ion-ratio fails high or low; analyte reported as an EMPC

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A Amount detected is less than the Lower Method Calibration Limit.

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit.

E Amount detected is greater than the Upper Calibration Limit.

S The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).

Q Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s).

I Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s).

Data Qualifiers: PCB's

SGS

B	Analyte was detected in the Lab Method Blank (LMB) at a concentration greater than 20pg/L or 5 pg/g, and the concentration in the associated sample is less than 10 times the LMB concentration.
U	Identifies a compound as not being detected.
C	Data refers to the first of the co-eluting congeners.
Cx	Data is listed under the lowest numerical congener number in the group where 'x' references the lowest congener.
EDL	Estimated Detection Limit
T	Retention time shift.
ppt	Parts-per-trillion (pg/g; ng/L)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit.

An average uncertainty of 30% can be routinely achieved as concluded from the evaluation of HRGC-HRMS standard operating procedures. The following flags warn the data user of situations where the uncertainty may be greater than stated.

A	Amount detected is less than the Lower Calibration Limit.
J	Amount detected is between the Method Detection Limit and the Lower Calibration Limit.
K	Data is being reported with a failing ratio and should be considered as an estimated value.
E	Amount detected is greater than the Upper Calibration Limit.
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s).
Q	Indicates the presence of a quantitative interference. This situation generally results in an underestimation of the affected analyte(s).
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s).
#	Outside quality control limits
*	See case narrative

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 119374 (1)

G296-389

Page 1 of 1

For Lab Use Only
Cash
VOA Ref/Trip
Req'd Temp. No.
Project Manager
Shipping Tracking No.
E-97820134

Client Name	Project Name
URS Corporation	Swmu54
Address: 5540 Falmouth St, Ste 201	Client Project No./P.O. No.: 11605351
Richmond VA 23233	Invoice No. ☒ Client ☐ Other (comments)
Phone 804-965-9000	Contact/Report To: Roshanak Aryan
Fax 804-965-9764	

Analyses Requested

Explosives

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
1	54 MW-5	TH1403	6/5/07	1640		X	GW	2	2	
2	54 MW-9			1435		X		2	2	
3	54 MW-3			1730		X		2	2	
4	Eq Blank			1120		X	W	2	2	
5										
6										
7										
8										
9										
10										

Sampled By (print): Tina DeVivo
Sampler's Signature:
Company: URS Corporation

How Shipped? Hand Carrier fedex
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
Tina DeVivo	6/6/07	13:30						
1. Received By	Date	Time	2. Received By	Date	Time	Received By	Date	Time
	6/12/07	1015					6/14/07	0920

5.8°C Custody Tape Intact

TriMatrixCOC -- COC

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

SGS

CHAIN OF CUSTODY RECORD
SGS Environmental Services Inc.

Locations Nationwide
- Alaska
- Hawaii
- Ohio
- Maryland
- New Jersey
- North Carolina
- West Virginia

www.us.sgs.com

074197

(1)

CLIENT: BWS Corporation

CONTACT: Roshanak Anyan PHONE NO: (804) 965-9200

PROJECT: SWMU54 GW-Q3 SITE/PWSID#: 1165635

REPORTS TO: Roshanak Anyan E-MAIL: roshanak_anyan@bwscorp.com

FAX NO.: (804) 965-9764

INVOICE TO: Client QUOTE #

P.O. NUMBER

SGS Reference: G296-389

PAGE 1 OF 1

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE (C=COMP, G=GRAB)	Preservatives Used: ICE	Analysis Required (3): Dioxin Furans (8290)	REMARKS
	54MW-6 ✓	6/5/07	10:55	GW	2	G	X		
	54MW-4 ✓	↓	12:18	↓	2	↓	X		
	54MW-7 ✓	↓	12:37	↓	2	↓	X		
	DUP1 ✓	↓	—	↓	2	↓	X		
	~~Eq Blk~~								

(5)

Collected/Relinquished By:(1)	Date	Time	Received By	Date	Time
Tina DeVino	6/6/07	1330		6/7/07	1020
Relinquished By: (2)	Date	Time	Received By:	Date	Time
Relinquished By: (3)	Date	Time	Received By:	Date	Time
Relinquished By: (4)	Date	Time	Received By:	Date	Time

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C: 2.3°C T

Special Deliverable Requirements:

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☐ RUSH _____ Date Needed ☐ STD

9

☐ 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
☐ 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
☐ 1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761

White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data is necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCS/LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination	n	Failed Signal to noise ratio		

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SOLID WASTE MANAGEMENT UNIT 54 RCRA FACILITY INVESTIGATION/ CORRECTIVE MEASURES STUDY REPORT

VOLUME II

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

FINAL
SEPTEMBER 2008

URS

CONTRACT NO.
DACA31-00-D-0011
DELIVERY ORDER NO. 0027